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Sinclair abandons Pandora display

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- **Sinclair abandons his flat screen TV technology for Pandora portable**
- **Pandora's Spectrum-compatibility scuppered by Amstrad deal**
- **'Credit card' software – new configuration**
- *Full details below and inside*

SINCLAIR Research appears to have abandoned the notion of using its flat screen TV in the Pandora portable and is instead to use a more conventional Liquid Crystal Display (LCD).

Sinclair's original plan involved using an SLR camera style configuration of flat screen TV and magnifying mirror to produce a readable display. Reports of the prototype s performance were conflicting but it appears that the viewing angle was critical and this tells against a portable designed to be used in a variety of environments. Sinclair s decision to go for tried and tested LCD technology therefore has a certain amount of logic to it.

The machine itself is still likely to use credit card software but rather than using disc or card for data storage it will be configured to store data in the 1M of Ram it will have on

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IN THIS WEEK'S ISSUE

AMSTRAD 464/664/6128, ATARI 64K, BBC 32K, CBM 64, MSX 64K, SPECTRUM 48/128K





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Voted
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SOFTWARE▶



GAMES▶



◀PROGRAMMING

REGULARS▶

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ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work

Commodore to shed another 70 jobs

IN yet another round of redundancies Commodore has cut its Corby staff by 54 per cent The latest jobs lost are in the company s 70-strong sales and servicing team which has been closed down This leaves only 50 people working in the echoing caverns of the Corby factory

The closure of Commodore s servicing facilities means that from the beginning of July dealers will have to make their own arrangements for repairs and support

Commodore has appointed Verran Micro Maintenance as its agent for repairs and support and has recommended that dealers use this company

Commodore UK s acting general manager, Chris Kaday said that the loss of the sales and servicing team was part of the knock-on effect of the company s plans to sell the Corby plant which ceased micro production in January It has been decided that service spares and warehousing should be transferred to third parties pending the sale rather than relocated Kaday added that the new stripped down operation would be more flexible and in line with the operations which competing companies run

No buyer has yet been found for Corby but although Commodore had intended to lease back some of the plant it now seems likely that the company will move out

Clive Planning screen test?

Pandora loses its flat screen TV

◄ Continued from page 1

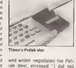
board Sinclair s original plan involved using Wafer Scale Integration units for storage but the new company set up to produce these (see separate news item) is aiming the devices further upmarket, so units for the Pandora may not be available for some time

In any event the project is now very much up in the air Pandora was initially intended to be Spectrum compatible but as Amstrad now has the rights to the Spectrum this is probably no longer an option The machine was to have been produced at Timex's Dundee factory but the abandonment of the flat screen display means Sinclair is no longer tied to Dundee which is one of the few places in the world that can produce it

The Pandora project itself is now Sir Clive s personal baby, so much so that no-one at Sinclair, with the exception of Clive, is able to comment on it

Fire fuels exports

A fire at a Hungarian microchip plant has practically wiped out the country s chip production capability, and is likely to have serious knock-on effects throughout Eastern Europe This could, however, be good news for Western computer manufacturers as it is likely to expand further the market opened up by Timex Portugal s recent deal with Poland to supply 800 000 Spectrum-based machines and 200 000 disc drives



Timex's Polish star

Takis Patrikarakos of Micro Interface, which acts as European agent for Timex Portugal and which negotiated the Polish deal, stressed 'I did not start the fire but the arrival of the Spectrum in Poland could signal the adoption of the machine throughout the Eastern bloc' He was therefore hopeful that Timex could play a part in any Hungarian deal

The Eastern Europe market is still largely untapped and because the United States continues to block the export of more advanced machines like the IBM PC and the QL it is particularly attractive to companies like Timex, which sell 8-bit micros The 800 000 machines going to Poland represent a significant addition to the estimated five million Spectrums sold so far and give an indication of the market s potential size

Medic boss plans comeback

FORMER Medic Datasystems boss Chris Skoglund may be attempting a come-back, trading under the name Easysoft Both Hampshire Fraud Squad and the Official Receiver are eager to discuss Medic s affairs with Skoglund but the latter is currently out of their jurisdiction in the Republic of Ireland A spokesman for the Official Receiver described him as very naughty

Medic which had trailed a series of QL peripherals including disc drives and Ram expansions through 1985 crashed last December after cashing customers cheques and failing to deliver the goods According to Hampshire Fraud Squad, Skoglund is unable to trade in this country until such time as he cooperates with the Official Receiver but attempts to contact him have all failed

Information received by *Popular Computing Weekly* indicates that Skoglund is using the Easysoft name to set up an Irish based mail order software company

This will use mail shots to sell software direct in this country *Popular Computing Weekly* would be interested to hear from anyone receiving such a mail shot

WSI revisited

SIR Clive Sinclair s Wafer Scale Integration project is off the ground again under the auspices of a new company called Anamartic – the Greek for fault free The new company is being backed by Barclays Bank to the tune of £2 million and is thought to be attempting to raise finance in the City

WSI itself was initially intended to be a battery backed-up Ram equivalent of a Winchester disc providing cheap mass storage for micros The project now seems to have been revised to provide storage for more specialised mini-computer systems with first units being shipped towards the end of the year

Amstrad Tolkien

MELBOURNE House is to release *Lord of the Rings* and *The Hobbit* for the Amstrad PCW 8256 in July, and is also planning to convert *The Hobbit* to run on the IBM PC and the Apple

The company also intends to sell a repackaged version of the Hobbit without the Tolkien novel for £9 95 although the earlier version will still be sold at the old price of £14 95 The relaunch will be supported by coverage in computer magazines, national and regional newspapers and local radio

Games are big at CES show

FIRST reports from the Consumer Electronics Show (CES) held in Chicago earlier this week indicated a dramatic surge in the games market. Japanese newcomer Nintendo was there alongside the more established games console specialist Sega and both companies had taken very large stands.

At the time of his Sinclair purchase Alan Sugar expressed interest in the dedicated games machine market, citing the success of Nintendo's console in Japan as justification for this. More recently this has fuelled speculation concerning an Amstrad/Nintendo tie-up but the latter's presence in Chicago may mean it's prepared to go it alone in the West.

Atari, which cites its own games consoles as a primary reason for its return to profitability under Jack Tramiel, seemed to have taken matters a little far. The company was running a large stand which combined business and games but which seemed to fall uneasily between the two.

On the software side the major US players including Microprose, Sublogic, Batteries Included and Activision/Infocom were there, with the latter duo giving Infocom's adventures their first outing under the Activision banner.

Of the UK companies Mastertronic and Firebird's US arm, Firebird Licensees were the most bullish.

Both claim promising US operations, and Firebird's morale has gained a timely boost by Elite's arrival at number one in the US Billboard chart.

Early reports from the show also suggested that IBM PC clone prices had dropped even further, with some of them predicting a fall to $350 by Christmas. This would put Amstrad's PC in the mainstream pricewise, and could help establish the IBM standard in the home/small business area.

Amstrad hires Timex to build its Plus 2

PRODUCTION of Amstrad's successor to the Sinclair Spectrum, the Plus 2, will shortly be under way at the Timex factories in Dundee previously used by Sinclair Research. The new machine is scheduled for launch in September, will have a built in tape deck, at least 128K Ram, and will cost £140.

Timex's contract with Amstrad is for the manufacture of this machine and for 8256 printers, and although Timex won't comment on the number of units involved the initial computer order isn't likely to be for more than 100-150,000 machines. Timex spokesman Jim Muir expressed satisfaction on the winning of the contract and said that it would employ 100-200 people for a year.

One source close to Timex did however suggest that the contract price had been pitched deliberately low to secure the business, and that it was unlikely the company would make any significant profit on the deal. Whether Amstrad will countenance a price rise later, however, remains to be seen.

At the time of his purchase of the Sinclair rights Amstrad boss Alan Sugar complained that EEC duties on microchip imports made it difficult for him to produce in the UK.

He said then that he wished to manufacture here, but that Sinclair's UK suppliers would have to make the grade in terms both of price and quality.

It would appear that Timex has done this, although the initial order is small compared to the sort of sales level a new Spectrum machine would be expected to achieve.

Lonely QL seeks financier.

Backers back away from QL 2

TONY Tebby, who floated plans for a QL mark two at the last ZX Microfair, has parted company with his first backers but claims to be on the point of signing a contract that will save the project. Tebby had initially asked dealers to "put their money where their mouths are" by investing in the project but failed to raise the required £250,000.

He claims that although dealers are clamouring for stocks of the machine, it's a different story when they're asked to put money up, and he views their lack of action as "highly hypocritical". However one dealer who had been considering investing money told *Popular Computing Weekly* that he and others had been reluctant to move until Tebby's QDOS compatible operating system was finished.

Tebby himself is still confident that the machine will go into production, and is aiming for a September launch and delivery in October. Its specification was being finished last week, and further development should follow.

OU aims for low-price PC

THE Open University wants its own micro produced and is inviting manufacturers to comment on its required technical specifications. These are ambitious – the machine should run PCDOS or MSDOS, have a minimum 512K Ram, 512K disc storage, 300/300 and 1200/75 modem, serial and centronics ports, mouse, three expansion slots, PC/AT style keyboard, monitor and 100 cps printer.

All this, says the OU, should be available for £500. The machine itself will also have to be able to run *Lotus 1-2-3*, *UCSD Pascal*, *Gem*, *PC Automator*, *Sidekick* and *Wordstar*.

At the price the obvious contender for the contract is Amstrad. Although the PC the company intends to launch at the end of next week won't include a modem, a twin disc version of the machine with monochrome monitor and 512K Ram would be within striking distance of the OU's requirements.

Other major manufacturers who might be interested include Olivetti, which is interested in establishing MSDOS as an educational standard, and Sanyo, whose cheap PC compatibles are already approved for use in Germany's schools. The low price, however, coupled with the fact that the OU predicts a maximum of only 30,000 sales in the first year of the course, 1988, means that the contract won't be as attractive to manufacturers as the BBC one was.

Firebird's Thrust is Superior

FIREBIRD Silver's *Thrust*, only the second Firebird budget game to top the charts, is to be released as a full-price BBC game by Superior Software. Firebird's version, for Commodore 64 only, costs £1.99 while Superior's game will retail at £7.95 for tape.

Speaking on behalf of Firebird, a smug Tom Watson observed that Superior's pricing of the game showed what good value Firebird's 64 version was. Firebird, he said, hadn't wanted the BBC rights because BBC games tend to be more expensive, and it wasn't felt worthwhile to release it as a BBC budget game.

Firebird itself is currently negotiating to buy the 68000 rights to *Elite*. Should the company be successful this is likely to produce the *Elite*-like game it promised at the *Personal Computer World* show in September 1985.

Product News



Pagemaker for Amstrad lauached

AMS's Pagemarker is now available for the Amstrad 464 664 and 6128 – three months late The product had been scheduled for launch at the Manchester Amstrad Show in March

The package combines a typesetter graphics and word processor for £49 95 Details from Advanced Memory Systems 166-70 Wilderspool Causeway, Warrington WA4 6QA (0925 413501/2/3)

T-shirt printer

BANBURY Business Computers is marketing Underware'/ Transfer ribbons – special printer ribbons designed to allow you to transfer lettering and images from the screen to T-shirts and other fabrics In order to do so you have to convert your screen design to mirror image using *AMX SuperArt*, *Pagemaker* or a screen dump routine, then print out onto ordinary listing paper

The design can then be ironed onto fabric and is claimed to be permanent and washable The ribbons cost £12 for black and £19 for five colour

Details from Banbury Business Computers, 3 Schofields Way, Bloxham, Banbury oxon (0295 720812)

CBM teletext adaptor

MICROTEXT has produced a teletex adaptor for the Commodore 64/128 The adaptor turns the Commodore into a teletext receiver, and is claimed to be the only one of its kind suitable for use througnout Europe (except France) Australia and New Zealand It fits into the machine s user port and costs £99 95

Details from Microtext 7 Birdlip Place Horndean, Hants PO8 9PW (0705 595694)

RS232 checker

MAPLIN is now selling Heathkit's PMK-130 Breakfast Box which can be used to test and modify the interlacing of computers and equipment using the RS232b standard Battery-driven It allows lines to be switched around to determine the correct pinout It costs £78 95 plus VAT

Details from Maplin Professional Supplies, PO Box 777 Rayleigh, Essex SS6 8LU (0702 552961)

Pocket Wordstar on the Amstrad

MICROPRO has transferred *Pocket Wordstar Deluxe* to the Amstrad 6128 PCW 8256 and 8512 micros *Pocket Wordstar Deluxe* is an improved version including the *Spell Star* spelling checker and a mailmerge facility It costs £69 95

Details from MicroPro, Haygarth House 28-31 High Street, Wimbledon London SW19 5BY (01-879 1122)

Diary Dates

JUNE

10-12 June
Comdex International in Europe
Nice France
Details Business exhibition covering computers printers peripherals and software.
Trade only
Organiser Interface Group 01-734 7282

13-15 June
The Amstrad Computer Show
Novotel, London
Details: Hardware software and peripherals for Amstrad micros.
Price £3 adults, £2 children, £1 discount for advance sales.
Organiser Database Publications 061-456 8383

24-26 June
Computer '86
G-Mex Exhibition Centre Manchester
Details Business and industry computer show formerly known as the Northern Computer Show
Price Free entry by business registration.
Organiser Reed Exhibitions, 01-643 8040

JULY

16-18 July
PC User Show
Olympia, London
Details Hardware and software for IBM machines and their compatibles.
Organiser EMAP 01-608 1161

24-27 July
Acorn User Exhibition
Barbican Centre, London
Details: Hardware, software and peripherals for the Electron, BBC micro and Master machines Trade only 10am-1pm on 24 July
Price £3 adults £2 children, £1 discount for advance sales.
Organiser Editionscheme 01-349 4667

SEPTEMBER

3-7 September
Personal Computer World Show
Olympia, London
Details: Software and hardware for home educational and business computer users. For the first time the year the show is to be organised in three speerate halls – business, games and education.
Price £2.
Organiser Montbuild 01-487 5831

13-14 September
Commodore Horizons Show
UMIST Manchester
Details: A wide range of Commodore hardware software and peripherals
Price: £3 adults £2 children, £1 discount for advance booking
Organiser Database Publications 061 456 8383

26-28 September
Electron and BBC Micro User Show Barbican Centre, London
Details Software hardware and peripherals for the Electron BBC micro and Master machines Produced by Acorn.
Price £3 adults £2 children, £1 discount for advance booking.
Organiser Database Publications 061 456 8383.

Prices dates and venues of shows can vary and you are therefore strongly advised to check with the show organiser before attending *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser

Letters

Printer error

I read with interest your article in this week's (May 15) issue of *Popular Computing Weekly* concerning our Centronics GLP printer. Firstly thanks very much for reviewing the GLP but I did notice a slight error in the copy which your readers may want to know about.

Peter Worlock suggested that he would have preferred a hardware setting for NLQ mode. On the front panel of the GLP are two Sinclair style switches marked 'On Line' and 'LF' above 'LF' is an LED marked 'NLQ'. When the GLP is off line the 'LF' button may be used to line feed paper for positioning before printing, and when on line the 'LF' button can be used – at any time – to toggle NLQ whenever desired, shown by the state of the LED on or off.

I am glad that you reviewed our machine and explained the full potential as well as you did.

D C White
Saga Systems

Peter Worlock replies. Okay – I missed this in the documentation, but why not actually mark the switch to make it clear?

Disgraceful quality

I think the quality of tapes marketed is disgraceful. Firstly the actual quality of the tape is poor, resulting in sides not loading due to blanks, poor recording or age of tape. I have experienced all three and have either had my money back or had replacement tapes, the latter not always rectifying the problem. Another problem is the encoding methods hyperload novaload loading with fast baud rates, all of which do not help with loading and reinforce the problem after the tape is barely a couple of months old.

Thirdly the games themselves, they suffer from being drab, barely playable ie poorness of design and plot, you can't help feeling that it's been a waste of money and that reviewers don't know what they are talking about. Moreover it is usually overpriced.

Of course the software companies claim that their pricing policy is to regain lost revenue via piracy. The home pirates give the pricing policy for their excuse, not the excuse of breaking the law to be 'hard'. When a good piece of software comes into the consumer's hands it will be undoubtedly transformed to another media to overcome the inadequacies. If the media it was bought on eg with a button device, a game could be transferred from low quality tape originally bought to high quality tape. The companies may scream blue murder because of lost sales, they should have put it on quality tape in the first place.

Take note of the record industry – comparing singles to software titles and software titles to albums you can see the difference, especially when artists take longer to produce albums than programmers take to write a single program.

Software companies should produce games on credit card-style cartridges. They cannot be reproduced by the consumer, have a long lifespan and can store up to 1M. Maybe we can then expect decent software at prices similar to that of records, single titles priced similar to singles and compilations near to album prices.

Darren Stanley
Worthing
W Sussex

One reason for comparatively higher prices for software that you do not mention is volume of sales, a number one software title sells far fewer units than a number one record.

Piracy is a very real threat to software publishers, which detracts considerably from their sales, but transferring a title you have bought to a better quality blank tape does not necessarily lose the publisher revenue.

Star Letter

QL Positioning

The AT command on the QL is very useful for positioning characters on the screen for *Print* statements but never have I seen it used for *Input* statements even though it can be used to position the flashing cursor. If the first listing below is substituted for the second one then the operator doesn't have to wait to find out what the questions will be before answering the current one.

Listing one

```
5 REMark "first listing"
10 CLS:CLS#0
20 PRINT
30 INPUT "AMOUNT £ ";PND
40 PRINT
50 INPUT "RATE ";RAT
60 PRINT
70 INPUT "CURRENCY ";CUR
80 CLS
90 REMark "now use AT"
100 AT 10,2:PRINT "FOR £";PND;" YOU
GET ";CUR;" ";PND/RAT
```

Listing 2

```
5 REMark "2nd listing"
10 CLS:CLS#0
20 AT 6,4:PRINT "AMOUNT £"
30 AT 8,4:PRINT "RATE"
40 AT 10,4:PRINT "CURRENCY"
50 REM "" use AT for inputs
50 AT 6,14:INPUT PND
60 AT 8,14:INPUT RAT
70 AT 10,14:INPUT CUR
80 CLS
90 AT 10,2:PRINT "FOR £";PND;" YOU
GET ";CUR;" ";PND/RAT
```

D J Piggott
Saudi Arabia

D J Piggott gets a year's supply of *Popular* binders.

Spectrum quirks

I have found an unusual and somewhat advantageous quirk on the Spectrum 128.

When using *The Music Box* by Melbourne House, I broke into the program and typed *Spectrum* which brings it into 48K mode and then typed *Run*.

I found that you can still have proper three channel sound on a normal Spectrum. It seems that the sound chip can be used in 48K mode, but only in machine code as the mode does not have the *Play* command.

I also discovered that if you

continued on page 10 ▶

Puzzle

Puzzle No 211

Jamie and Ben were sitting idly watching the Bank Holiday traffic go past. 'Want to make a bet?' enquired Ben. 'Fifty pence stake each and winner takes all.'

'O K' replied Jamie. 'What's the bet?'

'You name any number in the range 1 to 999' explained Ben, 'then we watch the number plates of the passing cars to see if your number comes up. We'll only count the more usual type of registration number – foreign plates or those with more than three digits in the number part of the plate we'll disregard. Now as any number in the range 1 to 999 is equally likely to come along, we'll count off the next 500 cars that pass. If your number is amongst them you win the pound. If it's not, I win! That's a fair bet!'

'Just a minute!' replied Jamie. 'That's not fair at all! To make it a fair bet and our chances equal my chosen number has to appear on one of the first –'

How many cars did Jamie state must pass if the bet is to be a fair one?

Solution to Puzzle 206

The smallest box with the required property is one measuring 12 by 21 by 28 inches. This will have a volume of 7056 cubic inches and a surface area of 2352 square inches.

The program takes the three principal dimensions as variables *A*, *B* and *C* and calculates the volume and surface areas in each case. Each of the variables differs from the others, A being taken as the largest of the three, and the smaller orders of sizes are computed first.

Winner of Puzzle No 211

The winner is John Wheeler of Sutton, Surrey.

Rules

The closing date for puzzle No 211 is July 2.

```
10 A=3
20 FOR B=2 TO A-1
30 FOR C=1 TO B-1
40 VOL=A*B*C:AREA=2*
(A*B+A*C+B*C)
45 IF VOL/AREA<>3 TH
EN GOTO 60
50 PRINT A;" ";B;" "
C;" ";VOL,AREA
60 NEXT C
70 NEXT B
80 A=A+1:GOTO 20
```



Letters

I also discovered that if you go into 128 mode and type Spectrum again editing will be slightly faster

Finally a handy *Poke*, *Poke 23750 16* makes your program totally invisible to see and it also stops program titles being printed when loading This is useful when you are loading a program after a *Screen$* which you don t want distrubed

Paul Osborne
Romford

Star letters

Every week *Popular Computing Weekly* offers prizes for Star letters The most intelligent, pertinent, helpful, or simply interesting item in our postbag each week will win the writer a free year's supply of exclusive *Popular Computing Weekly* binders

Here is your chance to clear up that pile of old *Populars* under the bed and file them neatly, so get writing today

Send your thoughts to Letters *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP

Unitsoft problem

I recently wrote to you about not receiving certain items ordered from Unitsoft, a company advertising in your magazine

Could you please let me know if any progress has been made

L Coburn
Rotherham

As we reported in last week's News Desk, Unitsoft has ceased trading Since it was not registered as a limited company, settlement with the creditors lies entirely with Unitsoft s two partners For information and advice, you can write to John Henory and Co at 8 Lynedoch Street, Glasgow, Scotland This is the firm currently dealing with Unitsoft's affairs

Atari appraciation

I am delighted to see you have started to cover the Atari machines more I actually own a Commodore 64 at the moment, but after toying around with a friend s Atari 800XL, I know what a superior machine it is both for programming and for games etc It murders the C64 and its sound and graphics capabilities are amazing

'What are they going to call it? The BBC2?'

However I was shocked at Andy Moss s review of *King of the Ring* (April 3-9) where he said, It s nice to see some quality 8-bit Atari software being produced To be honest, I have never seen anything other than high quality Atari software

Please continue to review Atari software, Atari will make it big this year

G Wheaton
Bolton

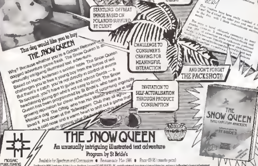
Binders wanted

The *Popular Computing Weekly* binders which you are giving away as a prize for the Star Letter are just what I need to control my collection of *Popular Computing Weekly*

Unfortunately I can t write letters good enough to be a Star Letter so please can you tell me how I can buy the binders and how much they cost

Stephen Vysny
St Andrews

***Popular Computing Weekly* binders are available at £3 50 each, from Helen Perry at 12-13, Little Newport Street, London WC2H 7PP Please add £1 50 to the cost for postage and packing If you order ten or more binders at one time, there is a 10% discount.**



Market choice

In the spirit of free competition and market choice Euromax Electronics has released a bundle of excellent controllers for the Commodore/Amstrad/Spectrum micros, some of which are familiar products repackaged and some of which are completely new

Euromax's joysticks and mice all have one thing in common they are certainly not of the throwaway variety and are all constructed to be durable and reliable

To look at the mouse products first Euromax's most familiar offering is the Cheese mouse familiar to *Popular* readers as the Wigmore House Commodore 64 mouse This device is a very sleek durable and reliable mouse with two large click switches and a non-slip rubber coated roller ball

The art package provided, *Cheese*, is an icon-driven program with a full selection of line box circle pattern and copy facilities, and is remarkably good Euromax is selling the cassette version of this system at £64 95 for the Commodore 64 and plans versions for the Amstrad MSX and Spectrum later in the year Pricey but worth it

A cheaper alternative is the Mighty Mouse, at £59 95 This is a slightly less streamlined device and to my mind less comfortable to use The switches are smaller though they have the same clean, positive action as the Cheese mouse

The Mighty Mouse works with the C64 Atari and Spectrum, and with the Amstrad using the interface box supplied This consists of a joystick-type port with a follow-on lead a power socket with lead, and a switch which converts the mouse inputs to joystick mode The Mighty Mouse is a fair alternative to the Cheese mouse, but I for one would be willing to pay the extra for the superior product

Also on the way from Euromax is a series of high-quality joysticks It continues to amaze me that cheap fragile sticks are selling in large quantities when something like the Euromax Micro Ace at around £15 95, is much more accurate and should last ten times as long This is a micro-switch joystick with a wedge-shaped body and single centre-mounted thumb-operated fire button I can attest to its accuracy and reliability since I used it to finally complete *Uridium*!

Also available is the Pro Ace at around £11 95 – the same body but with leaf switches Rather stiff in use and not so stirring an experience as the Micro Ace

Next up is the Wiz Card another of those credit-card-type controllers with a four-way pad operated by the thumb, and a fire button operated by the other thumb Pretty useless as you can imagine, to anyone without thumbs The Wiz Card like its lookalikes the JoyCard and so on is cheap at £8 95 and probably indestructible but would take hours of practise to master

Also in the pipeline is a series of micro-switch joysticks some with autofire and a tracker ball The Elite Professional Supreme and Turbo models will be launched between now and September, and cover the £15-£23 price range, while the Joyball will be around £34 95 **Chris Jenkins**

Program *Mouse/Cheese Mighty Mouse joysticks* **Micro** Commodore 64, Amstrad Atari etc **Supplier** Euromax, Pinfold Lane Bridlington North Humberside YO16 5XR (0262 601006)

Competition Results

Word Wizards

The moment you've all been waiting for – the winners of the hugely successful Word Wizards competition We were overwhelmed with the response as more than 2 006 of you entered

We asked you to find 18 computer-related words and to re-organise their initials into an 18-letter phrase The phrase as nearly all of you discovered, was Machine Code Monitor and the following are the winners

First prize C128D with colour monitor

Second prize Atari 520STM package

First prize of a Commodore 128D with colour monitor goes to C R Oswin of Christchurch The two runners-up prizes of Atari 520 STMs with disc drives go to Philip Moore of Rugeley, Staffs and M S Hurst of Eltham London SE9

Copies of Mirrorsoft's excellent *Spitfire 40* are on their way to Philip Northam of Dundee, David Collins, of London SE9, Michael Yates of Peterborough, Paul Burton, of York Nicholas Lumsden, of London E9 S Wright of Clacton, Gary Burns of Gateshead David Murray of St Albans R Shearing, of South Ascot; M Richards of Whitstable, Dennis Carroll of Renfrewshire T Cosens of Reigate Alistair Smith of Edinburgh, Chi-Yeung Choy of South Ruislip Mrs F Davis of Sheffield, G Mackenzie, of Dufftown David Crew of Ashford and Sue Davies at BFPO 21

The following BBC owners will receive copies of *Strike Force Harrier* G Osley of Hereford Alan Diamond, of Wembley Geoffrey Hirst of Halifax, Justin Lloyd, of Mid Glamorgan and T Gibson of Derby

Number crunching

It s a little bit difficult to say exactly who Psion is expecting to purchase its excellent (but hardly inexpensive) Organiser II Some of its features suggest a primarily executive market – but the *Maths Pack* contains functions which the average exec would have slight difficulty getting their head round

The Organiser does contain various common scientific' functions, (Sin Tan etc) which can be accessed from the Calc function on the stand-alone machine but Bessel functions, Eigen values, Error functions? This pack is certainly aimed at mathematicians scientists and students who want to do some serious number crunching

As with the *Finance Pack*, the *Maths Pack* is a read-only cartridge (which slots neatly into one of the datapak drives) that contains a series of procedures written in OPL (Organiser Programming Language) called up from the main menu The five main functions are *Solve* (for solving various types of equation), *Integrate* (for numerical integration) *Statistics* (offering *Error Function* and correlation) *Curve Fitting* and *Function* which will perform seven extra maths functions which are not catered for straight from OPL.

As I took it though some admittedly fairly limited exercises all the options worked well and I was pleased with the overall performance

There are calculators around that will do these sorts of things for you, but they are expensive and I suspect not as easy to use as the menu-driven Organiser

Certainly for numbers people with Organisers – and if you want a programmable calculator and damn the expense possibly worth buying the main unit just to run it.

John Cook

Program *Maths Pack* **Micro** Psion Organiser II **Price** £29 95 **Supplier** Psion Ltd Psion House, 18 Harcourt Street London W1

Dear diary

There is still a healthy support for the QL among consumers and it's heartening to see more and more support from the software houses, who may still make a healthy profit by producing the right kind of program for an eager public

If you re a busy professional who keeps a QL powered up on the desk during office hours, you might find Gemini s new package, *The Life and Business Organiser*, of some use Essentially a database of important dates it is easy to set up just input the date and then any information that you would normally keep in a diary Obvious applications are birthdays and other anniversaries and appointments, both business and domestic – but categories may be re-defined as required

Subsequently the program can be used as any other database a search function looks for the required string so that you may for example type in Aunt Mary to find the date of her birthday, or car to find when to send off the cheque for the road tax or book in for an MOT

But the program is more than this the next time you switch the machine on you ll be reminded of urgent dates and appointments overdue messages which have not been acted upon and so on Weekly and monthly charts can also be requested, which display a breakdown of appointments with double-bookings being highlighted

LBO is a very easy program to use and with the export-to-Quill option making hard copy available, this is a genuinely useful computer diary" – my QL already has all the copy deadline dates and auntie s birthdays oh dear no more excuses!

Tony Bridge

Program *LBO (Life and Business Organiser)* **Micro** QL **Price** £19 95 **Supplier** Gemini Computers, Gemini House, Concorde Road Exmouth Devon EX8 4RS

Them were the days . . .

I came over all nostalgic as soon as I saw the inlays produced on low-budget paper with the aid of the programs themselves The manuals chugged out using *Tasword*, reinforced this, and when *Designer* wouldn't load at first a tear sprang to my eye Amateurish production and poorly duplicated tapes? Ah them were the days

Unfortunately, just as production methods have moved on so have programming standards The two programs *Designer* and *Character Designer* are sold together, and are basically user defined graphics-based print utilities Both are Basic listings with a smattering of machine code – *Designer* helpfully has a memory map in the manual and volunteers the information that the machine code element takes up 250 bytes This slightly lop-sided approach becomes evident in areas like character reversal – the manual tells you that you have to wait a short period for this but doesn t tell you it s being done by a Basic *Peek* and *Poke* loop which is naturally slowed drastically by the Basic element.

Character Designer is relatively simple to explain – it's basically an enhanced version of the UDG designer programs you can pick up from magazine listings and is intended to plug into *Designer* The latter is a menu-driven system – again mainly Basic – which can be used to produce and print line drawing and text graphic designs When it does load it does its job effectively, but isn t really advanced enough to stand out from the crowd

I don t really see how Gap is going to find a market for these at a combined price of £12 45 (although they are available separately)

As far as I m concerned the clincher is the way the programs are protected There are several, fairly elementary methods used, one of them being the old *Ink 7 Paper 7* gag This was outdated three years ago, and quite frankly I find it impossible to take any program incorporating it seriously And using *Not Pi* to reduce memory requirement?

John Lettice

Program *Designer and Character Designer* **Micro** Spectrum **Price** £12 45 **Supplier** Gap Software 17 St John s Terrace, London E7

Living with the bomb

Christina Erskine talks to Infocom's Brian Moriarty about his latest adventure, Trinity

Text adventures are very much Infocom's territory; the company has deservedly earned itself a reputation for sophisticated parsing, fiendish puzzles and a rich vein of humour in its 19 titles.

In the US, where Infocom is based, the games are available on all the most popular machines, that is, the Commodore 64, 8-bit Ataris, 8-bit Apples, and the IBM PC.

Consequently, the UK has not had much of a chance to enjoy Infocom's adventures en masse. Although the company had a marketing agreement with Softsel over here, it did nothing to bring down prices to the level at which British consumers were used to paying, and Infocom has thus had more of a cult status here.

All that is set to change with the acquisition of Infocom by Activision, announced earlier this year. The full Infocom catalogue is set to become more readily available in the UK, and at a cheaper price. Provisional pricing is at three levels, £19.95, £24.99 and £29.99, but Activision has yet to finalise this.

Infocom's 20th text adventure is being unveiled at the Summer CES in Chicago this week. Called *Trinity*, and written by Brian Moriarty, who was also responsible for *Wishbringer* last year, it has all the hallmarks of classic Infocom titles but with a more controversial theme than most.

Trinity's plot centres on the history of atomic weapon testing throughout the world, from the first test site in the Mexico desert which gave its name, Trinity, to the adventure, through Nagasaki, the Pacific Islands, to the Siberian wastes.

As the player, you get the chance to visit all these places and try to avert the bomb's detonation. The action takes place in the near future, so you have the US's SDI (Star Wars) to contend with as well.

"I did a lot of research to make sure everything was as accurate as possible," claims Brian Moriarty.

Fantasy land

It's a brave subject for a game, and certainly not one you would associate with Infocom's humour. Brian explains:

"I have tried as much as possible to place these real events within a fantasy land. You start off in Kensington Gardens, in London, and enter the rest of the game through a white trap door, so it's separated from reality in that sense.

"However, all the scenarios are recreated as faithfully as I could. My research was very extensive. I read as much as I could on the bomb and visited some of the test sites, including Trinity itself. I started on the *Trinity* project in 1983, but I didn't start actually writing and coding the adventure until about a year ago."

Did all the research, reading and accumulated knowledge change Brian's own views on the nuclear threat? "I certainly feel I have a better informed philosophy now. But the main game thrust is not one of facts and figures. It still retains a humorous vein, although it's not in bad taste, after all, it's a serious subject."

Brian had wanted to write an adventure featuring the atom bomb for some time; he was interested in the fascination that nuclear weaponry holds over people.

"There is something seductively appealing about it to juvenile minds – it's almost pornographic," he explains. "I remember reading about nuclear technology as a boy – there's something almost God-like about it, because you are almost literally wielding the power of the universe; creating and exploding a hydrogen bomb, for instance, is like manufacturing a star.

"When I began the specific research I started to see its fascination as pornographic rather than seductive. I can't see how anyone in their right minds could work in a nuclear laboratory, yet, aside from the fact that the uses it is put to are abhorrent, it comes down to a fascination with billion dollar toys.

"I hope the game will be both entertaining and thought-provoking. If I get lots of hate-mail because of it, then I'll know that at least I've made people think."

He certainly made Infocom's testers think. A number criticised *Trinity* for being biased towards one faction or another; others stringently checked the accuracy of the scenarios. All Infocom titles spend six to seven months being tested, both in-house, and also by about 100 members of the public, before being released.

True to Infocom tradition, Brian was solely responsible for *Trinity*, its research, design, coding, packaging, and the famous Infocom "freebies" in the pack. *Trinity* includes a book on the history of the nuclear age, written by Brian himself.

It was coded, as are all the titles on Infocom's own development system, based on a DEC20.

"It looks extremely old-fashioned, like a large set of refrigerators," said Brian. "But the system itself, which we call ZIL, for Zork Implementation Language, has been refined over the last six years so that it's now very easy to use, and you don't need a vast amount of programming experience to get to grips with it. ZIL is based on MDL, a high level language which is based on Lisp.

Nuclear age

"The other great advantage of ZIL is its portability. The completed code for *Trinity*, which took up 1.3 megabytyes of space on the DEC20, was compiled down to 256K into Z code, which is entirely machine independent. All we need after that is a small interpreter for Z-code for each machine. That's why we've always been able to bring out a number of versions of any one title very quickly."

Brian does not foresee any great changes for Infocom now that it has joined the Activision stable. "We're not moving, we're not changing staff, no-one is coming down from Activision to tell us to put graphics on the adventures – we'll squash that idea before they even think of it – and while we may diversify our range we'll do it carefully. Games based on role-playing systems like *Wizardry* or *Ultima 3* are a good bet, *but there will be no arcade games from Infocom*; we're just not interested."

***Trinity* will be launched by Activision under the Infocom label in the UK this summer, for the Commodore 64/128, Apple IIc, Atari ST, Macintosh 512K, Commodore Amiga and IBM PC**

St Brides meets the Snow Queen

John Minson joins Gerda on her quest to rescue her friend Kay from the Snow Queen

I must confess to loving Hans Christian Andersen's story, *The Snow Queen*. Despite the simplicity of the surface quest, it's full of the deep symbolic meanings that get psycho-analysts so excited and ruled over by a brooding sense of evil.

I also have a great regard for St Brides, the Irish St Trinian's whose first adventure was one of last year's oddest releases. Put the two together and you have a quirky two-part classic which should reach a wide audience thanks to a publishing deal with Mosaic.

The plot

Kay and Gerda were the best of friends, always together in their small Danish town, until one day the greatest and most wicked of the goblins made a mirror. Everything that was reflected in the glass appeared horrible, but when the goblins tried to take the mirror to Heaven it shattered, showering the earth with its fragments.

Now one of these tiny slivers made its way into Kay's eye and suddenly he became as cold as a stone as the evil worked its terrible distortions. And when, one day as he was playing in the snow, a magnificent sleigh came by, he tied his little sledge to it and was dragged away. Unable to recognise good from evil, he was soon seduced by its driver and became a captive of the terrible Snow Queen.

In the village the people said that Kay had drowned. But Gerda refused to believe that he could be dead and one morning vowed to search for her friend.

Gameplay

Unusually for an adventure, you play a female character, Gerda – or rather you advise Gerda. She has a mind of her own and sometimes she'll do as she wishes. At one point your advice gets her understandably annoyed and when you try to interrupt the scrolling instructions you'll be put firmly in your place – until she needs your help again!

The first problem is a traditional one – how to leave the house. I was initially disappointed to find so commonplace a beginning, but when I had the answer all became clear.

The initial puzzle teaches you to think of Gerda as a real person. Unless you ask her to do everything you would expect her to, she won't even start her quest. And unlike many adventures, most objects are not signposted here, so think carefully about your surroundings.

To help you on your way there's an abridged version of the story included and careful reading provides a host of clues, but the ladies of St Bride's have carefully interwoven new puzzles, which call for more traditional adventure deduction, into the narrative.

At times you'll find that a little commonsense will take you on a linear course through the story, while at others you'll be racking your brain because you know what you need to do to continue – you just don't know how to do it!

Not that restrictions of vocabulary are going to hinder you. There's a useful list of words on the inlay, which may contain clues, and some quite sophisticated sentences are allowed for an adventure originated with *The Quill*. You can *Look Under* and *Through* things as well as *Examining* them and you'll need to do a lot of the latter.

My one complaint was the absence of a Ram Save, for though you can't get killed you might get sent back to your Grandmother and an end to your adventuring career!

As expected from St B's it's all very atmospheric and literate with some simple, suitably story book illustrations and spots of pleasantly melancholy theme music. It's both funny and full of mystery – and it's wholly convincing.

Don't let the fact that this is based on a 'fairy tale' and distinctly un-macho put you off. It's a welcome change from the norm. Instead let yourself fall under *The Snow Queen*'s spell.

Tips on playing

- Can't leave the house? Then read the story carefully, look everywhere and remember that cleanliness is next to godliness!
- Gerda will soon be feeling hungry but doesn't have the dough to buy bread. Finders may be keepers but honesty pays dividends so search for a lost purse.
- Trouble with the tear-away rough girls? If Gerda's got a present to bribe them with her journey can continue.
- Attention to the story should get Gerda to the old lady's house – but getting out again isn't so easy!
- Talking to the flowers will help, and to the birds, but Gerda will have to persevere with her reading if she's to get the clue that will open her eyes.
- In the garden an apparently useless investigation may well pay dividends later so long as Gerda collects a nest egg from the tree.
- At last everything's coming up roses but how can Gerda open the gate? Obviously somebody has the key but you won't find it if he's gone into town, will you?
- Outside the city returning something to the Raven that's rightly his will win a friend. And don't neglect to reflate your economy with some fruit from a nursery rhyme tree.
- Loitering in the city at night isn't advisable so find the inn before you go bumping into the palace guard.

John Minson

***The Snow Queen* is available for the Spectrum and Commodore, cost £9.95 from Mosaic Software, 187 Upper Street, London N1 1RQ. A hint sheet to take you further in the adventure is available from Snow Queen Dept, St Bride's School, Burtonport, County Donegal, Ireland.**

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TROJAN

Micro Computer Software & Accessories

Telescopic vision

Tony Kendle provides some tips for those wanting to enjoy the complexities of Mercenary, plus listings to help you sail through Starion and Nightshade



It s always fascinating to see just which games provoke the most reaction from our readers, and certainly the one that seems to have struck the deepest chord with Commodore and Atari owners is *Mercenary* Following our solution to the game published a few weeks ago I have had yet another letter from someone eager to point out aspects and complexities that we had missed

Steve Baker of Barry in South Glamorgan has these four extra tips

1 The Anti-Time bomb does not just stop destroying buildings it also allows you to re-build a destroyed building by firing at it This makes it possible to correct mistakes and play the game indefinitely

2 If you are being attacked by a Paylar or a mechanoid ship fly backwards This tactic makes it very easy to avoid them

3 If you are being attacked and cannot destroy the enemy land and get out the ship Doing this will mean that when you are hit the ship is not destroyed and you can get back in it

4 You have mentioned that you can transport yourself down from the space station using the door with the symbol on it in the laboratory However when you come out in the land base you will find that everything is now displayed in a mirror image and you will need to look at your map in reverse (This works on the Atari version anyway)

Well thanks for the extra help Steve *Mercenary* seems to have combined those elusive qualities of immediate fun, good graphics and sufficient strategy to keep people coming back even after they have finished it The only thing wrong is that it isn t available on more machines and I suggest that all Spectrum owners etc should barrage Novogen with complaining letters

As promised the other week, here is another welcome communication from our correspondents Julian Lyndon-Smith and Kean "Suggsy" Johnson who together are Hackers Unlimited Before we get on and publish their latest Amstrad Pokes, this time for *Nightshade* and *Starion*, we have a message from the pair

Working routine

"We are looking for someone overseas to join Hackers Unlimited so that we can have some sort of contact over in the UK Could you please ask anyone who thinks that they have the qualifications (presumably an interest in Amstrad hacking) to write to us at JM Lyndon Smith 83 High Street Berea, Johannesburg South Africa or Kean Johnston P O Box 12063 Benoryn, 1504, Transvaal South Africa

The first routine listing 1 is for the fantastic game *Starion* which seems to have frustrated nearly everyone since it was released The cheat routine will cause your Hull Temp' to remain constant thus eliminating 95% of the likelihood of your demise To run the cheat, rewind the tape to the start, press play and *Run* listing 1 which will automatically skip the basic loader

Do not worry about the screen display — if your monitor displays garbage then the routine is working

```
Listing 2 - Infinte Lives for
Nightshade

10 REM $$$ From Hackers Unlimited
$$$
20 MODE 1:INK 0,0:INK 1,6:INK
INK 3,15:BORDER 0:MEMORY &12FF
30 LOAD"!npic",&1300:CALL &1300:
LOAD"!",&1300:POKE &8FD3,0:
CALL &1300
```

Because of the large number of data statements we have included a checksum at the end of each line which should ensure accurate typing

Listing 2 gives infinite lives for *Nightshade* Again rewind the tape to the start and run the routine, although this time the game will appear to load and run as normal

Can I just remind you of the Hackers promise that anyone having trouble using the Pokes for the tape version of *Sorcery* can blame it on changes in the hardware compared to their 464 s A revised routine will be delivered soon"

Unique background

Martech has released one of its strongest titles to date with *This Planets*, a program that combines gameplay with ' education' in a more successful way then ever before In fact the educational content really works to add a unique background and depth of interest to the game rather than being the reverse a way to sweeten the medicine with a game It s certainly a good compromise to look for if your parents/partner keep asking why you don t do something useful with your Spectrum rather than just playing *Bomb Jack*

Of particular interest is an announcement that Martech is planning a competition based on the game Within the program are a number of clues for the solution of the very difficult Alien Game and we thought that the first person to manage it deserves a prize We thought it would be appropriate to offer a telescope

Media astronomer, and consultant to Martech, Heather Couper will choose the particular model but it is promised to be high quality If anyone does solve it in the near future contact Martech immediately or us if you don't have the address

```
Listing 1 - Constant Hull Temp for Starion
10 REM $$$ Starion - Cracked by Hackers Unlimited $$$
20 MODE 1:INK 0,0:INK 1,6:INK 2,18:INK 3,26:BORDER 0
30 MEMORY &3FFF:LOAD"loader",&8000
40 add=&C000:FOR lin=100 TO 120  STEP 10
50 FOR dat=1 TO 21:READ a$:a=VAL("&"+A$):POKE add,a:tot=tot+a:add
=add+1:NEXT
60 READ a$:a=VAL("&"+A$):IF tot<>a THEN PRINT"Data error in line
";lin:END
70 tot=0:NEXT:tot=0:add=&8000
80 FOR dat=1 TO 21:READ a$:a=VAL("&"+A$):POKE add,a:tot=tot+a:add
=add+1:NEXT
90 IF tot <> &5D1 THEN PRINT "Data error in line : 130":END  ELSE
 CALL &C000
100 DATA 3E,00,32,45,80,32,51,80,21,00,80,11,00,FF,01,FF,00,ED,B0,
21,7B,0722
110 DATA 02,11,00,A4,3E,99,CD,A1,BC,3E,C9,32,AA,06,21,00,FF,E5,21,
00,C0,0887
120 DATA 11,00,3E,3E,99,C3,A1,BC,00,00,00,00,00,00,00,00,00,00,00,
00,00,0346
130 DATA 21,7B,02,11,00,00,01,00,A4,F3,ED,80,C3,2B,FF,00,00,00,00,
00,00,05D1
```

Degenerate criminals

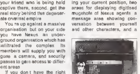
How do you write a brilliant game? Start with superb animated graphics add some great background music and sound effects, stir in some fine arcade action a tricky puzzle and fast gameplay under joystick control Right?

Right Enter *Nexus*, the first game from Nexus – a new software house made up of several former Beyond people You are a reporter sent into the HQ of a Colombian drug baron Your mission is twofold – first find your friend who is being held captive there, second get the real story behind this degenerate criminal empire

You re up against a massive organisation but on your side you have Nexus an underground organisation which has infiltrated the complex Its members will supply you with guns a camera, and security passes to gain access to different areas

If you don t have the right pass for each area you can still operate – but keep an eye open for the guards and a finger on your stun gun trigger You need to search hundreds of rooms and corridors to find your friend, and the 128 bits of information you need for your story You also score extra points for taking pictures

Gameplay is a sort of cross between *Impossible Mission* and *Enigma Force*, combining the best elements of both The screen is split into several sections – an animated window which shows the action a larger map of each corridor showing your current position, two areas for displaying digitised mugshots of Nexus agents a message area showing conversation between yourself and other characters, and a large block which tells you what actions are possible and what you find in different locations



You can also call up a separate screen which allows you to change weapons, take pictures, review your score or – in dire straits – restart the game

One feature missing, and it s a major omission, is the facility to save a game in progress Nexus says this couldn t be implemented on the 64 version although it will be used in other versions After much practice however it should be possible to complete the game in one session

My other reservation is whether there is sufficient variety in play to maintain interest over a long period but the fight sequences are great fun as your hero somersaults slides rolls punches and drop-kicks his way past the pppostion Or shoot them – simpler but rather unsporting

Nexus deserves to be a big hit and it is a first-class debut for this new software house Arcade fans should snap it up

Peter Worlock

Program *Nexus* **Micro** Commodore 64 **Price** £9 95 cassette £12 95 disc **Supplier** Nexus Productions DSB House 30 High Street, Beckenham Kent BR2 1AY

Ultimate back on form

Those days when Ultimate releases were eagerly awaited have well and truly gone (the disappointment of *Cyberun* saw to that) – but with the release of *Pentagram*, there are definite signs that the doldrums at Ashby-de-la-Zouch may be over

On loading the game you are presented with the now very familiar single colour 3-D side-on display *à la Knight Lore* While it s certainly another arcade/puzzle/adventure in the classic Ultimate style on playing it I was captivated by the deviousness of the tricks, the humour and atmosphere created by the various sprites and graphics – plus the fact that this one is going to be very very tricky to complete

The scenario is, as usual fairly vague You control the sabreman in his quest for the pentagram, and the inlay is covered with assorted mumbo jumbo which I expect, contains various clues too deep for me to fathom

Controls are rotate left/right walk jump pick up/drop (I haven t found anything I can do this to yet) and yippee fire supported via keyboard or Kempston, Cursor and Interface II joystick Ysa you can zap things and you ll find you have to

If you hang around in a location long enough you are attacked by witches on broomsticks zombies amoebe and the most realistic looking bed mites I have ever seen

As for the main quest well who knows how you are going to go about solving it — so far I've got nowhere but the feeling of I ll-just-have-one-more-go is still there

Don t expect to be stunned by the originality of presentation – but lovers of *Knight Lore et al* will not be disappointed here

John Cook

Program *Pentagram* **Micro** Spectrum 48K (128K compatible) **Price** £9 95 **Supplier** US Gold, 10 Heneage St, Parkway Industrial Centre, Birmingham

Burning rubber

It s a jungle out there The city is overrun with drug pushers, hit-teams cruise the streets and Mr Big is running the stuff into town in armoured cars Faced with problems like these the city fathers had to turn to you

The equipment you re given isn't a bazooka half a dozen tank traps and a squad of National Guard however – it s a 150 mph Lotus Turbo Esprit It also houses a 20mm cannon (and you thought it was a cigar lighter) powerful enough to make the question do you feel lucky, punk? somewhat academic

Armed with the above kit, you burn rubber up and down the city streets searching for the drug dealers These can be recognised by their red black and white cars while innocent traffic is blue or yellow

To intercept them you have to scream through the streets checking their position every now and then on your computerised map You can then carry out a summary Judge Dredd-style execution with the cannon or score extra points by arresting them by bumping them from the rear

The racing simulation part of the game is fairly rudimentary – you ve no gears and steer from lane to lane with joystick left and right You have to stop at a garage to refuel every now and again and have four cars to use

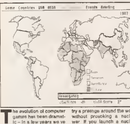
Maybe it s the peculiar plot, but I found this one difficult to relate to I feel that too much of the game is spent intercepting the opposition and not enough in actually grabbing them when you ve tracked them down I'm afraid I don't feel driven to buy this one

John Lettice

Program *Turbo Esprit* **Micro** Amstrad **Price** £8 50 **Supplier** Durell Software Castle Lodge, Castle Green, Taunton



Diplomatic crisis



The evolution of computer games has been dramatic – in a few years we ve gone from crude invaders-type shoot em ups to *Elite*; from the imaginative but patchy graphics of *Manic Miner* to the superb animation of *Impossible Mission* and from the moronic persers of early adventures to the intelligence of Infocom games

This year has seen a similar breakthrough in strategy games with the release of *Balance of Power* on the Macintosh Written by Chris Crawford (of *Eastern Front* and *Legionnaire* fame) *Balance of Power* goes further than any other game in putting the real world inside your computer

The object of the game is simple to increase your country s prestige around the world without provoking a nuclear war If you launch a nuclear strike, you lose If your opponent launches a nuclear strike you lose If either side causes an accidental nuclear war you lose

You gain prestige by supporting friendly governments and trying to subvert hostile ones Throughout the game, different countries will endure civil wars and revolutions – you support the side which will favour your country

You can choose to play against the computer or against another human controlling either the USA or the USSR The best games are against the computer

The game runs from 1986 to 1994 and each turn takes a year In the Beginner level, your choices are simple ship arms to a government or its rebel opposition, or – more drastically – send in your own troops to support one side

When each side has made its plans for the year the opponent can question and oppose them Initially this takes the form of a quiet chat between the two nations If neither side will back down, it becomes a diplomatic crisis and prestige is at stake If things escelate to a military crisis even more prestige is on the line and the risk of nuclear holocaust increases

The game is won or lost on crisis management You must pick your fights carefully and the computer plays a very intelligent game so bluff and bluster will rarely succeed

In higher levels of play, you have increasing options such as using economic aid to win friends and influence people, sending in the CIA or KGB to provoke anti-government incidents using your diplomatic corps to sway public opinion and making treaties

Balance of Power is a game of unsurpassed excellence It has intelligence, subtlety and an enormous amount of detail – and in key confrontations the suspense is killing

Although at present versions are available only for the Mac and IBM PC, an Atari ST version is likely

Peter Warlock

Program *Balance of Power* **Micro** Macintosh 128 **Price** £28 95 **Supplier** Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 5LQ

Elves and spells

Where to begin, faced with value which is outstanding even for the budget labels' budget label Central Solutions? There's nothing amazingly good but nothing amazingly bad either for which we must thank the ever popular *Quill*

You could almost see this as a survey of mainstream adventuring There s a predominance of elves and spells and quests for mystical rings – the usual blame-it-on-Tolkein stuff Then there s a pirate treasure hunt a dream world made true, some sci-fi etc, etc

From my quick overview, the games all seemed to demonstrate reasonable competence Some showed humour others generated atmosphere with lengthy preambles

So do you buy? The question is whether you can stand to play another *Quill*-ed adventure without screaming If you can and you don't expect the state of the art but are merely looking for a diversion, then you won t go far wrong

John Minson

Program *10 Adventure Game Pack Vol 2* **Micro** Spectrum 48K **Price** £6 95 **Supplier** Central Solutions Ltd 500 Chesham House, 150 Regent Street, London W1R 5FA.

Tomato purée

Take cover! The Killer Tomatoes are on the loose! Prepare yourself to be sterilised with fear (it says here) as you plunge into the squishiest game ever, *Attack of the Killer Tomatoes*

Based on the winner of one of the coveted Turkey movie awards the game could well have been as much of a turkey as the film However *Tomatoes* is saved by a whacky sense of humour and a challenging game method

You play Wimp Plasbott (?!!?), unremarkable vegetable processing operative who clocks on at the PuraTom plant one day to find that the tomatoes have mutated Moving through umpty-several screens shown in the familiar 45-degree perspective you must help Wimp to stun rogue tomatoes by jumping on them pick them up and carry them to the crusher, then deliver tomato puree to the pizza parlour But beware of the KILLER TOMATOES!

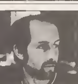
Fast and deadly they can only be defeated by weapons found around the factory – but I haven't yet found out how to destroy them

With so many companies bringing out turkeys unintentionally it s good to see Global making such fun out of a deliberately ridiculous scenario I m looking forward to seeing the game of *Absolute Beginners*

Chris Jenkins

Program *Attack of the Killer Tomatoes* **Micro** Spectrum 48K **Price** £7 95 **Supplier** Global Software, PO Box 67, London SW11 1BS





Water, water everywhere

Tony Bridge dons his lifebelt to look at some nautical adventures

Avast me hearties splice the timbers and shiver me mainbrace – or er sorry about the lapse into Newtonese but there's a definite nautical flavour to The Corner this week brought about by four Quill'd programs the first three for the Commodore 64

Eye of Java is one that has been lying around on my desk for several weeks now, and I'm afraid that I have a confession to make – the name and address of the author have been mislaid, and appear nowhere in the program itself! If the author reads this please get in touch so that I can pass on your name

The adventure is text-only of course white on blue the scenario is standard issue – "find the *Eye of Java* in the depths of the castle then destroy the evil siren" There's a lot of exploring to do on the beach, which is where you start off – several caves are repositories of valuable items

Changing light

The atmosphere is quite nicely handled with some evocative descriptions of the seashore and the various caves a touch that I particularly liked was the way time seems to pass as you revisit locations As the day wears on, so the descriptions reflect the changing light Quill'd adventures need touches such as this to prevent them falling into the 'formula' although I haven't had time to explore the whole of this adventure, I'd like the author to contact me if possible with a map so that I can see more and pass on more comments to readers

From Jon White of Hallmark Software comes *Rescue Party* the second of our Quill'd Commodore games (both of which are on disc) Again the player is plonked on to a desert island this time after a massive volcanic explosion As usual (I don't know why) you don't seem to know who you are or what you're doing here but you can bet your sweet bippy that before you get home to *East Enders* you're going to have a few problems! You *are* told your task – to find two adventurers lost together on an important historical find

Rather than discovering yourself on the beach this time you are in a small boat and the first few problems take place in the cramped conditions on board Examining locations yields several useful objects among which are batteries and a torch And surprise, surprise Jon White has of course like every adventure-writer before him included the dark place which follows every discovery of a torch so the first move is to insert the batteries into the torch This is quite possible – but switching the torch on does not yield the desired result Obviously dead batteries and what's this here? The galley offers up a warm stove so I tried popping the batteries therein, in the hope that they might be warmed into life, no go I'm afraid

Without the torch, the player can't get up on deck, so after a quick look I'm stymied However, this start is promising with rather short descriptions but sensible and enthralling problems I'm sure that the adventure must get even more engrossing later on and hope to bring you an update on my progress Write to Hallmark Software 122 Springhills Harlow Essex CM20 1TB

Sound effects

I have always associated Colleen Software with programs for the Amstrad machines but now they have moved across to the Commodore with a text adventure *Mystery Voyage* It may not contain any pictures, but there is an awful lot of sound effects and music to keep the player occupied James Molloy of Colleen tells me that

Adventure Helpline

Terraform on Spectrum How do I open the spaceship's exit hatch? John Richards 12 The Willows Selsey W Sussex PO20 0JT

The Pawn on QL. How do I get past the alchemists. How to get planks? What are tree stump and garden tools for? J P Walker 3 Moss Rise The Mount, Mapperley Nottingham NG3 6GG.

Se-Kaa of Assiah on Spectrum. I cannot get past the dwarf to enter the crystal palace P Clipsom 5 Marrams Avenue Cromer Norfolk

Stolen Camp on BBC B How do you get the key from the key box? Daniel Tilley 4 St Bernard Road Colchester, Essex (Tel 843220)

Gremlins on Spectrum How do you kill the gremlins and what is needed? Andrew Taylor, 65 Edward Street, Grimsby S Humberside

Sphinx Adventure on Electron No progress Any help most welcome Robert Davies 2H Rectory Road Sofrydd Crumlin Gwent S Wales

Zim Salabim on Commodore 64. How do you get into the palace? Any other help gratefully received T Stokes 95 Lower Drayton Lane Drayton Portsmouth PO6 2HE.

Heavy on the Magick on Spectrum. Password for Quadra Porta Dave Jones 12 York Close Beckton London E6 4QN

Lords of Time on Amstrad I can't get past the cavemen Jane Fisher New Hall, Cambridge CB3 0DF

Red Moon on Amstrad. How do I create the bridge? I've got the acorn and the scroll Jane Fisher New Hall Cambridge CB3 0DF

Classic Adventure on MSX. I have all 18 treasures but I can't find the end of the game what next? I have scored 150/210 Michelle Drabwell 17 The Gladeway Waltham Abbey, Essex

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand

Fill in the coupon explaining your problem send it to us, and a fellow adventurer may be able to help

Remember – the system only works if those adventurers who have solved the puzzles get in touch Every week is Save An Adventurer Today (SAAT) week!

Adventure........................ **on (Micro)**........................

Problem..

....

Name..

Address..

....

these were created with their new package *The Colleen Music Compendium* to be released at the PCW show in September The results, as previewed in this adventure, are very interesting for Commodore owners

The opening scene of *Mystery Voyage* has the almost lifelike voice of the ship s captain shouting man the lifeboats ' and other such social niceties The screen clears and then you find yourself adrift on a raft in the blazing sun it s a simple matter to paddle ashore, and then you re on a beach again For some reason, beaches hold a strange fascination for adventure-writers I suppose the first lot of a few million grains of sand looks much like the next, which lets the writer off the hook when it comes to writing a good meaty description Back at the *Voyage*, your exploration of the beach is accompanied by some great music and some not-so-great sound effects The effects themselves are well-done, the problem is the frequency of the effects for example waiting a certain doom-laden location means sitting through several seconds of ghostly doom-laden suspense chords OK the first time and a help in creating the atmosphere but at subsequent hearings extremely frustrating

Apart from this the adventure cracks along at a good rate – although I poked a bit of fun at the beach locations quite a good deal of atmosphere is present, and the adventure develops well with new locations presenting new problems Some of these problems can get rather tasteless at one point, you stumble upon a maggot-ridden corpse and closer examination reveals – your breakfast I m afraid! The resulting pool of vomit (I know it s disgusting isn't it?) can be examined, but I wouldn t recommend it

Mystery Voyage is an interesting romp with a lot of atmosphere and although the music can sometimes become irritating there s no denying that it is accomplished with a certain style The spelling of my copy is rather atrocious, but I imagine that this will have been thoroughly checked by release date The adventure is in three parts, with passwords into the second and third parts but the asking price of £14 95 is a bit steep to say the least

Tiresome chore

Available now for the CBM 64/128 and later for the Atari and Amstrad ranges it s worth looking at if Colleen take the necessary action Contact Colleen Software 18 Bishop Street Penygraig CF40 1PQ or telephone Tonypandy (0443) 434846

The final sailor s delight this week is from the experienced *Quill* of Torrance and Liddle whose previous effort, *Subsunk* was one of the most under-rated adventures of 85 The sequel *Seabase Delta* is now available from Firebird in their silver 199 range, and it s even better

Documents found on a body in the first location reveal that a missile is aimed at the British base and will fire as planned That s it as far as scene-setting goes but presumably you must get your finger out and somehow stop the missile Also on or about the body you ll find a card of the type which in adventures, are just asking to be inserted in a slot somewhere Sure enough the card is the secret to getting about in the seabase in the travel tube is a car waiting for you The pretty tedious sequence of *Wear* (seat) *Belt*, *Insert Card* must be gone through each time you want to travel and the time taken for whooshing sound effects (covering up the computer's processing time) all adds up to a rather tiresome chore that unfortunately just has to be put up with There are quicker ways of travelling luckily – for example an elevator will take you from this first level up to the second and a quick slide down a mail-chute will get you back

The illustrations are pretty good, though re-drawing them on each visit to a location adds to the frustration but the authors can t be accused of being stingy with the objects as you'll stumble over dozens of 'em You can t carry them all of course so they must be used wisely and in the proper sequence

All in all, then, a good game with plenty of humour lots of easily visited locations lots of objects and plenty of problems (not all easy) to be chewed over


DO YOU WANT TO BE A HERO?
Biggles
The result of unique co-operation between three ace software developers and the Biggles film production company, Biggles – The Untold Story will knock you right out of the air! It's a multi-part arcade strategy game in which each part must be completed to reach your final goal.
In the air, on the rooftops, on the ground, or in the trenches
YOU CAN BE A HERO!
Coming in May
Commodore 64 £9.95 tape £12.95 disk
Spectrum 48K £9.95 tape
Coming in June
Amstrad CPC £9.95 tape, £14.95 disk
MIRRORSOFT
Purnell Book Centre, Paulton, Bristol BS18 5LQ

POPULAR Computing WEEKLY

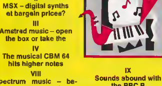
SPECIAL supplement

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MUSIC AND THE MICRO

INSIDE



The musical micro has come a long way since the days of the silent ZX81. Since the first noisy home machine, the Vic 20, was introduced, the potential for music making has grown and grown. Now many people use their computers as controllers for musical instruments, or as instruments in themselves, exploiting the fast data handling and powerful editing facilities which are second nature to the computer.

But remember, although a computer can polish your performance, it's the musician who must come up with the ideas. Although we'll be looking in this supplement at sound creating software, composition programs, MIDI software to control synthesisers, sound sampling and digital drum machines, it would all be meaningless without the creative input from the programmer. Whatever micro you own, you should be able to get more out of your music with the right software and hardware. ◄

Atari arrangements

WHILE THE ST'S ARE BECOMING POPULAR, THE EIGHT-BIT MACHINES ARE STILL MAKING MUSIC AS MARK JENKINS DISCOVERS

Although the Atari 520 and 1040 models are fitted with a MIDI interface, the music business has been slow to adopt either machine for serious use.

One early MIDI package is the Treesoft MIDIRecorder from Mopro, sold in the UK by SECS. The package simulates an eight-track, sixteen MIDI channel tape machine complete with a picture of a tape recorder with spools turning during play mode. Recording is real time and there's a variable count-in before starting. Seven replay speeds are available and the Timing display which is pulled down using the Atari's Mouse allows you to offset the start of each pattern by a variable amount. The MIDI display allows you to set a MIDI channel for each track and enter a note of what synthesizer was connected.

Each track can hold up to twelve hours (!) of music and information can be copied from one track to another. "Ghost Tracks" can be created with the same notes but different delay and other settings without using up any extra memory, and sections of music can be labelled with a name (such as "intro") which allows you to locate them immediately. You can sync to drum machines and other MIDI devices and Mopro plan a MIDI scoring package, a Music Programming Language and a Yamaha DX7 synth editor. ◄

Mopro, Mittevrouwensingel 93, 3514 AL Utrecht, Holland. Tel 030-714897. SECS, 514 Alum Rock Road, Alum Rock, Birmingham B8 3HX. Tel. 021 328 3585.

Coming up for the 520ST is the Steinberg 24-channel MIDI composer. Steinberg are thinking of adding a hardware interface to provide footswitch and other functions denied to packages which just use the Atari's built-in MIDI socket. They point out that the MIDI Out on the 520 is also wired to give MIDI Thru on the unused pins 1&3 (see Owner's Manual p 75) so it's possible to obtain MIDI Thru functions using a divided cable. However, their package will eventually have its own dedicated MIDI Thru socket.

Steinburg, 68 Wilsdon Way, Kidlington, Oxfordshire OX5 1TX, 08675 5277.

Recently launched for the 520ST was a version of Activision's The Music Studio. This is similar to the existing Commodore 64 version except that it is largely mouse-driven and has improved MIDI facilities.

Notes can be entered from the computer keyboard or from a music keyboard in step time and are displayed on a musical stave or a colour block chart. The computer can play up to three voices and MIDI instruments can sound up to a total of 15 voices simultaneously.

Music can be edited with the cursor and blocks can be copied, deleted and inserted. Note values can be changed and notes can be tied, divided by bar lines, sharpened and flattened.

Songs can be saved to disc and recalled very quickly, and a special MIDI assignment

page allows you to set the MIDI channel of each sound programmed and an appropriate synthesizer patch The program is ideally suited to the Casio CZ-101 synthesizer but will work with any MIDI equipment. ◄

Activision, 23 Pond Street, Hampstead, London NW3 2PN, 01-431 1011.

For the eight-bit Atari micros, Digicom and marketing a MIDI interface with IN OUT and THROUGH sockets which plugs into the 1050 disk drive and compositional software Again the package is ideal for the Casio CZ-101 but is suitable for any MIDI equipment

The 400 800 XL and XE computers can be used and Digicom can supply interface cables, software and a MIDI tutor as well as a CZ-101 if desired The 16-track MIDI recorder software is organised like a tape machine, with RECORD PLAY and STOP commands, real time recording with velocity and pitchbend response step time recording MIDI channel switching, track merge and copy punch in/out, transpose, delay, mute autocorrect, tempo change, track loop clocking options and much more. £169 for interface and software. ◄

Digicom, 170 Bradwell Common Boulevard, Milton Keynes, Bucks MK13 8BG, Tel 0908 663708.

The Two-Bit Replay sampling system works on any 8-bit Atari with 48k memory Software is on tape or disc and the unit consists of a small cartridge with a minijack lead for sound input. Sound output is via the monitor

The Replay cartridge is not needed for the playing process, so its sampled sounds can be incorporated into a BASIC or machine code program with routines supplied. Samples can be saved onto the Atari data recorder or disc and it's possible to reload, mix, repeat and merge samples. There are two basic expansion packages – Digidrum comes with eight sampled drum sounds including bass, snare and clap and allows you to playback up to two sounds at a time. You can program 16-beat patterns and hold up to 30 patterns in memory, patterns can be linked together into a song and songs can be saved to disc or cassette

Digisynth allows you to sample sounds and play them back from the computer's keyboard Two electric guitar sounds and a selection of other effects are provided to get you started

The Replay system is tremendous value for money and the sampled sounds (with a maximum sampling rate of 21kHz) are of reasonably good quality Of course, the system is limited by the lack of a separate audio output and synchronisation facilities, but for less than £40 it s a bargain The Replay sampler and basic software costs £39 95 while the Digidrum Digisynth software on tape or disc is £4 95



2-Bit Systems, 44 Morcom Road, Dunstable, Bedfordshire LU5 4EG.

MSX melodies

MARK JENKINS COMPARES THE YAMAHA AND TOSHIBA MUSIC SYSTEMS

Toshiba's MX-10 computer (£99) and HX MU901 Keyboard and FM synth Module represent one of the most inexpensive ways into micro music hardware but current stocks of the system are being sold off as we speak.

The HX-10 is a conventional MSX machine with a single cartridge port. Into this fits the FM cartridge with connected keyboard, a full sized four octave design with three touch panels (Enter, Stop and a long Multi-purpose sensor) The Toshiba synth uses two sine wave operators" and so doesn't have the power of the better-known Yamaha CX-5M music computer, although it has much of its basic sound quality

Phono audio outputs on the cartridge provide an alternative to the monitor s sound the music software loads automatically and opens with a graphic display of a keyboard and drum kit which play along with three demo tunes The synth module is nine note polyphonic divided between bass chord polyphonic and drum sounds if desired

The main screen has ten main sections. POLY lists the sound number from 1 to 65 and controls vibrato and sustain BASS duplicates these functions for the left hand side of the keyboard if you decide to split it (bass parts are monophonic and the split point is at the second F#) and CHORD gives the same options and is active if the accompaniment is running.

A sequencer section records realtime performances several minutes long but there are few editing facilities beyond the possibility of replacing backing chords by pressing Stop a new chord, and Enter on the music keyboard.

The FM sounds cover brass piano string, bass, metallic and abstract effects, providing much of the power and clarity of Yamaha's DX9 despite the use of only two sine wave operators ◄

Toshiba UK, Frimley Road, Frimley, Camberley, Surrey, GU16 5JJ, 0278 62322

Much more powerful is Yamaha s CX5M MSX micro which has recently received a hardware and software update. The sound synthesising module of the CX5 fits underneath the computer, and it's now possible to replace this with a new SGF-05 module costing around £100 The SGF-05 has several advantages – its format is compatible with the newer DX100, DX21 and DX27 synthesizers and it has MIDI IN facilities which allow you to use the CX5 as a multitimbral MIDI expander synth capable of playing eight different monophonic sounds simultaneously
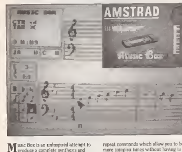
The software which allows you to compose on the CX5 itself has also been updated In cartridge form, this consists of a new FM Composer package and seveal educational packages. All the new packages support the updated MIDI facilities and there is an entertaining "auto-composer" package which for the first time introduces realtime as opposed to step time programming This is a step in the right direction for Yamaha, although there is already one real time composer package for the CX5 marketed by the independent company DMS

Significantly the SGF-05 Tone Module is to be available separately from the computer so it will be possible to add it on to an even cheaper MSX computer although you may have to figure out a suitable multipin connecting lead ◄

Yamaha UK, Mount Avenue, Bletchley, Milton Keynas MK1. Tel: 0908 71771.

Amstrad arrangements

DAVE MAHON ON THE ELECTRIC STUDIO S AMSTRAD MUSIC BOX, AND CHEETAH S FORTHCOMING MIDI SAMPLING AND DRUMSYNTH HARDWARE



Music Box is an uninspired attempt to produce a complete synthesis and composition package for the Amstrad To much time has been spent on the presentation and too little on the real musical necessities, it looks like it was designed by a programmer rather than a musician.

That said, there's little left out; the disk contains two main routines, Music Composer and Synthesiser a number of music demos and some sound presets. To kick off, you select which program you wish to run, then (after absorbing the four-page explanation of music theory) you are ready to create

Icons

The Editor screen is a bit messy, based around the "if it's too obvious, design an incomprehensible icon" principle The right hand side displays the treble and bass staves, the key and time signature are shown to the left, two icons give access to the editing and playback routines, a digital clock shows elapsed time (!??), and two panels show the major commands available from the keyboard

The 0 key toggles between rests and notes which can be placed on the staff using either the keyboard a joystick or a light pen Envelopes are chosen from the seven available, and you can move through the music either a note at a time of a bar at a time.

There are eight tempos settings available, and full transposition facilities, as well as repeat commands which allow you to build more complex tunes without having to repeat whole bars of writing. There are no bar copy, block copy or more complex chaining facilities, and the printout module is unimplemented at the moment, due to technical problems. The review copy crashed if you try to load a non-existent file.

The Synthesiser section, which has to be entered separately, allows you to define sets of seven instrument sounds which can then be filed and used in your compositions. The main display allows you to select the envelope on which you want to work, 1-7 then define a five stage amplitude shape using the cursor keys or lightpen. You can then define the waveshape ('tone envelope') which allows such effects as vibrato to be incorporated

There are several demonstration pieces provided on the disk, ranging from classical pieces to the *Eastenders* theme. Despite the three part harmonies, the lack of a music scroll routine makes it fairly impossible to learn anything from these so I can t really find anything in the Music Box to recommend it to either serious music students or amateurs who just want a quick and easy composition system ◀

Program: The Music Box
Micro: Amstrad
Price: £16 95 disk, £9 95
Supplier: The Electric Studio, PO Box 96, Luton, Beds, 0582 595222

Cheetah's entire range of music products – the Spectrum, MIDI interface, and sampler, is to be converted to the Amstrad machines. The AmDrum will be first off the production line, it has already attracted large orders from chains such as Boots, which played such a big part in the success of the SpecDrum

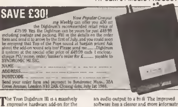
Like the original version, the AmDrum uses digitised samples of real sounds, which can then be arranged in real time or in step time to create realistic percussion patterns. Up to three voices can sound simultaneously, and there will be alternative sound sets made available so that you can build up your own favourite kits.

For more details of the Cheetah Amdrum the Sound Sampler and the MIDI interface, see the Spectrum section in this supplement. Specifications will be very similar and launch dates are around the middle of June for the AmDrum with the Sampler and MIDI interface following in due course ◀

Cheetah, 1 Willowbrook Science Park, Crickhowell Road, St Mellons, Cardiff, Wales, 0222 777337

CBM compositions

YOUR CHANCE TO SAVE MONEY ON THE TRON DIGIORUM AND WIN EXECLUSIVE MIKE OLDFIELD PRIZES, AS MARK JENKINS LOOKS AT CBM 64 MUSIC PRODUCTS



The Tron Digidrum III is a massively impressive hardware add-on for the CBM64 which allows it to become a digital drum machine. The initial updatas to the system added some outstanding new sounds, but now the digidrum is also fully MIDI-compatible via a standard interface such as those from SIEL or Jellinghaus.

The Digidrum edge connector slots into the 64's User Port and a phono socket gives an audio output to a hi-fi. The improved software has a clearer and more informative screen display which allows you to use demo rhythm patterns or program your own. An Editor routine allows you to load drum sounds from different files and combine them into one custom file, mix sounds, change the envelope, and set output volumes. song capacity is very large indeed, around 375 000 steps, and the sound quality is now better than ever. Drum sounds include standard kit, Latin percussion, glass instruments (very Depeche Mode) and electronic drums (very Simmons). MIDI synchronisation will allow the new Digidrum to lock up to sequencers and other drum machines, and indirectly to lock to tape and even video ◄

Syndromic Music, 35A Grove Avenue, Muswell Hill, London N10 Tel: 01-883 1335.

Supersoft's Microvox Digital Sound Editor has recently been updated but retains the same basic form. It's a hardware MIDI sampling effects unit for the C64 and costs around £230. It's monophonic and offers 0.8 second sampling at an excellent 20kHz frequency response or 17.28 seconds at 1kHz response (or anything in between).

The Microvox casing is half the size of the C64 and software is on ROM in the case of the pro system, or on disc. Audio In and Out jack sockets, MIDI In/Out ports, a ribbon cable connector to the 64's cartridges port, and fron panel controls for Gain, Mix, Output Level and Repeat complete the lineup.

The basic page display allows you to sample using an input gain bar display with adjustable threshold level, sampling rate and compander/filter. The Waveform Editor page displays the sampled sound diagramatically and allows you to to edit, loop, invert or fade it in or out. You can multi-sample until all the available memory is used, so it's possible to sample a complete drum kit of sounds to be played from the computer's keys, from a MIDI synth or from the software drum sequencer.

Sounds and sequences can be saved to disk and the software also has powerful echo and harmoniser (pitch shift) effects to alter the voice or any other sound via a microphone input. Microvox is the nearest you will get to a Fairlight on the Commodore 64! ◄

Supersoft, Winchester House, Canning Road, Wealdstone, Harrow, Middlesex, 01-690 1166

C-Lab's Supertrack is undoubtedly the most powerful Commodore 64 MIDI compositional system yet launched. It owes a lot to the Steinberg Pro 16 system which we have reviewed, but crams more onto its single main display and runs on a wider variety of MIDI interfaces. Cost is around £115 for the disc, while the cheapest MIDI interface without drum machine sync sockets will cost only £30 or so.

Sixteen tracks of real or step-time recording assignable to any MIDI channel are laid out horizontally with channel number, on/off status, MIDI channel, velocity level, transpose value, quantise value and loop length labelled. Tempo can be altered as the patterns play, tracks can loop around any portion of their total length quite independently, and maximum pattern length is 256 quarter notes in any time signature. 63 patterns can be held before disc dumping and used to create 8,500 note compositions comprising up to 255 patterns.

Playing can be auto-corrected for timing and patterns can be repeated in different keys or with different sections muted. Any of the 16 tracks of a pattern can be edited using a display of every single MIDI event which goes to make up the pattern, including note, velocity and patch change information.

Completed tracks can be transposed, delayed for echo effects, doubled or halved in speed, copied or "ghosted" to experiment with new velocity or transpose values, merged or "punched in" for overdubbing and saved to disc, via the MIDI interface you can link in drum machines and other MIDI equipment. ◄

Sound Technology, 6 Letchworth Business Centre, Avenue One, Letchworth, Herts SG6 2HR. Tel: 0462 675671.

Launched at the 7th Commodore Show, the latest digital drum-machine add-on



NU WAVE
PRESENTS MIKE OLDFIELD'S
TUBULAR BELLS
A MUSICAL AND VISUAL
EXPERIENCE
£7.95
CBM 64/128
Hot Line: 01-533 2918
CRL GROUP PLC, CRL HOUSE, 9 KINGS YARD, CARPENTERS ROAD, LONDON

is the Rhythm King from Supersoft, a natural follow-up to their powerful Microvox sampler. As usual, the emphasis is on good programming rather than fancy hardware, and the plug-in cartridge is featureless apart from a phono plug audio output.

The initial software release is on cassette, with disk to follow immediately after. The software supports 6 samples per drum kit, with two kits available in the initial software package. Three voices can be played simultaneously, and patterns can be composed or edited either in steptime using a grid system, or in real time simply by tapping the appropriate keys. An added bonus is a selection of sampled speech sounds which allow the Rhythm King to be used as a limited voice synthesiser.

The capacity is quite amazing: 255 32-step patterns which can be chained into songs with up to 255 steps of 255 repetitions. That's a lot of percussion!

Later versions of the Rhythm King will be able to incorporate samples made with the Microvox Pro sampler.

Onwers of the Datel or Tron Digidrum systems may be interested to know that Supersoft intend to make the Rhythm King software available for those products too. The hardware for all three is essentially the same digital-to-analogue convertor circuit.

Rhythm King sounds great and costs only £39.95. An excellent choice for budding Keith Moons. ◄

Supersoft, Winchester House, Canning Road, Wealdstone, Harrow, Middlesex, 01-

New Joreth Music packages running on the company's AL25 MIDI interface include a casio CZ-101 editor which can run from within their MCS compositional program. In a stand-alone form it gives graphic displays of all the popular synthesizer's functions which can be edited from the computer.

16 sounds can be stored in the computer's memory and dumped to disc or to the synth, and you can move sounds around within the computer's memory to create sets of sounds for particular songs. Cost is £44.85 plus the interface. ◄

Joreth Music, PO Box 20, Evesham, Worcs WR11 6G. Tel: 0386 831615.

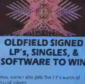
Steinberg have a selection of new music packages aimed at MIDI systems and specific keyboards. We have already reviewed their Pro 16 sequencer which is now well establisehd and the matching TNS Note Editor will convert its files to musical notation.

Steinberg also have a Casio CZ-101 Editor similar to the Joreth System, and an Ensoniq Mirage editor. Systems are also available for the Atari 520ST and Apple micros and we'll be reviewing the new releases as soon as they are available. ◄

OSC, 68 Wilsdon Way, Lyne Paddock, Kidlington, Oxon, Tel: 06285 5277.

Created by Mupados for WH Smith, Datahits combines a C64 with digital drum machines and effects units to perform music from best-selling games. Included are Rambo, Never-Ending Story, Ghostbusters, Cray Comets and Hypersports (Chariots of Fire). On the B-side you'll find SoftWhere?, a simple database with comprehensive refarence and index systems for compiling lists of game, record or cassette collection. The music is fun, the software is handy, the price is £4.99. ◄

Mupados, Unit 11, Llambed Industrial Estate, Tregaron Road, Lampeter, Dyfed SA46 6LT. Tel: 0570 422677



OLDFIELD SIGNED LP's, SINGLES, & SOFTWARE TO WIN

The most unusual music product yet for the Commodore 64 is No Wire's Tubular Bells. As the name implies it's a complete transcription of Mike Oldfield's world wide bestselling Seventies rock symphony played entirely on the 64's SID chip!

The music has been entirely orchestrated by a professional musician, and manages to cram the 24 tracks of Oldfield's original into the SID chip's three voices. 23 different instrument sounds are used.

To give you something to watch as you listen, the program is accompanied by a simultaneous light synthesiser display. You can control the speed, colouration, drawing mode and symmetry of the light patterns using the 64's function keys, and there's also an auto-performance mode if you jsut want to relax and listen.

Tubular Bells costs £7.95 on cassette or disk, but we have THIRTY copies to give away in our exclusive competition – and some more unique prizes too.

THIRTY lucky winners will get a copy of the Tubular Bells software. In addition the three first prize winners will get AUTOGRAPHED copies of the original Mike Oldfield Tubular Bells LP PLUS a copy of the latest Mike Oldfield single. The first prize winner also gets five LP's worth of record tokens.

All you have to do to be in with a chance of winning is to answer these simple questions.

1: What was the title of Mike Oldfield's SECOND album?
A Ommadawn B Hergest Ridge C Incantations

2: What is the last section of Tubular Bells called?
A Captain Pugwash B Sailor's Hornpipe C Drunken Sailor

3: Who introduces the last section of Tubular Bells Side 1?
A Dennis Norden B Michael Horden C Vivian Stanshall

If you think the answer to question 1 is Ommadawn, then put 1A and so on. Post your answers with your name and address on a POSTCARD or the back of a sealed envelope: send your entry to Tubular Bells Contest, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP to arrive no later than July 4th. The winners will be drawn from the Editor's extra large hat, and will be announced in the 17 July issue. ◄



Colleen Music Compendium
£49.95

Spectrum symphonies

ONE OF THE BEST-SERVED MUSICAL MICROS, THE SPECTRUM CAN SUPPORT MIDI COMPOSITION AND SAMPLING FACILITIES TED LAVITZ CONDUCTS

One of the best series of MIDI products for the Spectrum comes from XRI Systems. The MIDI interface costs around £99 and features one input and two outputs. There is also a sync socket for Roland type drum machines.

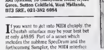
The software provided with the interface allows you to record in step time or real time. Eight lines of polyphonic music (up to 26,000 notes) can be assigned to any MIDI channel edited displayed in standard musical notation, then played in sync with your drum machine.



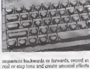
Equally significantly, XRI plan to cater for the "small synth" market with a series of "patch editing" packages. These include editors for the Yamaha DX7 smaller 4-operator synths such as the DX100 a Juno 106 Toolkit program sound library sets, and various MIDI-to-tape synchronisation products. ◄

XRI Systems, 10 Sunnybank Road, Wylde Green, Sutton Coldfield, West Midlands, B73 5RE, 021-382 6084

If you want to get into MIDI cheaply the Cheetah interface may be your best bet at only £49.95 Part of a series which includes the sublime SpecDrum and the forthcoming Sampler, the MIDI interface comes complete with software which allows you to store several thousand notes, play





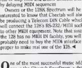


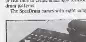
sequences backwards or forwards, record in real or step time and create unusual effects by delaying MIDI sequences

Owners or the 128K Spectrum will be interested to know that Cheetah will also be producing a Telecom DIN Cable which will connect the 128's RS-232/MIDI socket to other MIDI equipment. Note that since the 128 has no MIDI IN facility, you will probably need to buy the MIDI interface proper to make real use of the 128. ◄

One of the most successful music add ons is the Cheetah SpecDrum a digital drum machine using sampled percussion sounds which can be arranged in step time or real time to create amazingly realistic drum patterns

The SpecDrum comes with eight sampled

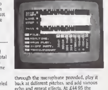




sounds, plus a couple of bonus sounds on the other side of the tape Cheetah are also releasing extra kits at the rate of one every couple of months. The first is a Latin set. including various woodblock, shaker tuned percussion and exotic sounds. More unusual is the Electro Kit, based on the trend setting Simmons electronic drum sounds, which can be loosely represented as DOOOOM! PWEE PWEE' CHUCK CHUCK CHUCK DOOOOM! Depeche Mode, eat your hearts out. Using the Kit Editor you can combine sounds from different sets, and very long and complex patterns can be created edited and saved to tape.

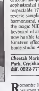
The SpecDrum is a must for every musical Spectrum owner, the only drawback being that it doesn't support MIDI or Roland DIN sync, but has its own tape synchronisation system The closest most of us will ever get to a Linndrum

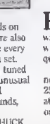
Cheetah are also working on a sound sampler for the Spectrum If you have seen the Datel Digital Sound Sampler for the Spectrum If you have seen the Datel Digital Sound Sampler, you will have some idea what these units can do, record a sound



through the microphone provided, play it back at different pitches, and add various echo and repeat effects. At £44.95 the Cheetah sampler is in fact much more sophisticated than this, offering a respectable 17.5 KHz sampling bandwidth, reverse sampling, editing, mixing, graphs, harmonising, echo and reverb, and all with the magic MIDI compatibility Using the keyboard of any MIDI synth, you should now be able to produce those N N-N-N-Nineteen effects in the privacy of your own home studio ◄

Cheetah Marketing, 1 Willowbrook Science Park, Crickhowell Road, St Mellons, Cardiff, 0222-777337





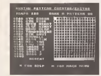
Romantic Robot's Music Typewriter assumes a good knowledge of music writing but comes with a keyboard overlay which helps you to pick things up more quickly

The program uses conventional musical notation, and can store 16 pieces of up to 254 bars total Three bars can be displayed at a time, and the graphics can be printed out to create your own sheet music.

Pitch range is six octaves tempo can be varied from 23 to 255 and you have full control over time signature and note value.

Sharps, flat, naturals, and transposition are all catered for The Music Typewriter is perhaps best suited to the serious music student, or teacher ◀

Romantic Robot, 77 Dyne Road, London NW6 7DS, 01-625 9463



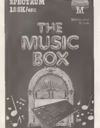
Midsoft's RAP software is designed for owners of MIDI drum machines such as the Drumtraks, Roland TR series, or the Casio sampling drum machine RAP uses a grid system to represent rhythm patterns, and allows you to create songs using sixteen rhythm tracks of up to 1000 measures chosen from 200 patterns. You can also use the package to control MIDI synths, so the more percussive presets of say, the DX7 become useful as drum sounds. ◀

Midisoft, PO Box 43, Romford, RM1 4EG, 01-32 1861

Melbourne House's WHAM! – The Music Box has now been converted for the 128 machine, and the 48 and 128 programs are being sold in one package (minus the Wham! tag – musical differences?)

The software version is dreadfully clever It uses a system of interrupts to create the illusion of two "voices", plus percussion sounds which can be inserted into gaps between the musical notes, and can be edited to your taste. Music can be compiled into a machine code file and saved for later use in your own programs. The screen presentation is very sophisticated, with full musical stave display, on-screen editing of tunes, full control over tempo and so on But more advanced musicians should note that all the compositions are in the scale of C Major, and there is only one note length available.

The 128 version is basically similar but adds a synthesiser section in which you can define the envelope of the sound produced by the new music chip. Composition is very fast and easy, and despite including huge chunks of Basic the software works very smoothly A recommended purchase for 128 owners. ◀



Melbourne House, 60 High Street, Hampton Wick, Kingston-upon-Thames, Surrey, KT1 4DB, 01-943 3911

Echo 1 music keyboard from MCCS

The absurdly named Oliver's Music Box from Cosmic Pop (?!?) is a sophisticated music transcription program which can cope with ties, triplets, transpositions, accidentals, tempo changes and so on. Music can be displayed either a page at a time, or scrolling as the music plays. Machine code files can be saved for use in your own programs. ◀

Cosmic Pop, PO Box 475, London E4 9UD

The Electro-Music Research MIDI interface is compatible with five programs. The Performer, which records eight polyphonic parts in real time, The Composer, a step-time sequencer; The Notator, which prints out music from the composer program, The Music Editor which allows you to edit Performer and Composer tracks, and The Voice Editor, which allows you to build up patch libraries for a wide range of MIDI synths.

EMR, 14 Mount Close, Wickford, Essex SS11 8HG

Speaking of keyboards, if you have a Spectrum 128 and are wondering what to do with the sound chip here are some suggestions; 1) try programming Terry Riley's semi improvisatory epic "In C" in Basic and making the Spectrum perform it endlessly or 2) look out for the MCCS Echo 1 music keyboard

The Echo 1 a full-size three octave mechanical keyboard add-on, is already available for the BBC and CBM 64 micros. The keyboard comes complete with a simplified version of the Organ Master software which allows you to play on the 128's sound chip, using preset sounds, and to create your own settings.

MCCS also manufacture the Echosound music amplifier, a 5 watt 6" speaker unit which will enhance the sound of your Spectrum 128 ◀

MCCS, 28 Hitchin Street, Biggleswade, Beds, 0767-318844



RHYTHM KING

digital drum machine for the Commodore 64 and the Commodore 128 (in 128 mode!)

Available now from Supersoft

MICROVOX PRO

the professional version of the much acclaimed MICROVOX digital sound sampler for the Commodore 64. As used by Fergal Sharkey!

SUPERSOFT
Winchester House, Canning Road, Wealdstone, Harrow HA3 7SJ
Telephone: 01-861 1166

MUSICPEN

DINOSAUR

The new Music System for the BBC Micro

An advanced MUSIC EDITOR combines fast music writing, using a lightpen, joystick or the keyboard to pick up notes from 'icons', together with simultaneous 4-channel display and playback

The SYNTHESISER screen imitates a real console with full display of all parameters and a 'Demo Mode' so you can hear the changes to the sound envelope as they are being made

The excellent MUSIC PRINTER, probably better than that of any other music software, gives a fully justified and aligned music score print-out.

A UTILITIES upgrade, available soon on disc or tape, will contain a Keyboard Module, a music file Linker, Enhanced Editing (with the option to use a Mouse) and many other useful facilities

Send £28.75 for 16K MUSICPEN chip and 60-page Instruction manual to: Dinosaur Software, 41 Cheney Way, Chesterton, CAMBRIDGE CB4 1UE or telephone Cambridge 322244 for further information.

B.B.C. B Ballads

KEN MAYHEW DISCOVERS THE SECRET HARMONIES LURKING WITHIN THE BBC B, USING DINOSAUR S MUSICPEN AND THE MUSIC 500 SYSTEM

Frequent users of the BBC's musical potential might be attracted by the convenience of a ROM program When this is coupled with the potential for light pen control, the result is a very powerful and user-friendly package

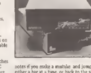
Dinosaur Software's Musicpen is a full synthesiser, arranger and editor package for the BBC B, designed with the benefit of music teaching experience by Sahlan Diver, with assistance from programmer Dave Chalmers. The program comes on a 16K ROM chip and uses disk or tape storage.

Musicpen's principles of operation are intended to be like that of a world processor enabling you to handle chunks of musical data as you would text. Though it's not as flashy as, say, the Island Logic Music System – none of your windown/icons nonsense – it is in some ways more powerful, notably in the handling of three-part harmony where all the voices can be displayed at once.

From the main menu, you can select a demo mode, lightpen/joystick setup (a mouse option is forthcoming), the synthesiser section, printing, disk utilities, or the editor page

The Editor allows you to select a key signature and time value from the menu, after which you can begin to place notes on the music staves. The note lengths available are shown in the lower section of the screen, with the rests below them.

The full range of notes available stretches from the C below the bass stave to the C above the treble stave The cursor keys are used to select the note pitch and a faster move can be carried out by using SHIFT at the same time. You can backspace to delete



notes if you make a mistake and jump either a bar at a time, or back to the start of the piece for playback.

One drawback to Musicpen is that the tempo range is limited to six possible settings, corresponding to metronome markings of 42 50, 60, 75, 100 and 150 bpm

Four music parts and one percussion line can be shown simultaneously, and of course can be filed to disk or tape, under any name you require up to 6 characters long. The synthesiser section is laid out in a graphic equaliser style rather than the more usual "synthesiser panel format. It consists of a number of vertical sliders' which can be controlled using the function keys. There is a function key strip included with the package which helps you to remember the controls for this and the editor section.

Envelopes

Sound settings ('envelopes') can be stored to disk or tape in the same way as music files, but are assigned a different prefix.

The last major function of Musicpen is printout, which at the moment can only be done on Epson or Epson code-compatible machines. Dinosaur Software is working on a printer utility disk which will make other printers available, and also in the pipeline is a file linker, transposition and copying routine, and other enhancements. Musicpen, whether you go to the effort of using it with lightpen or not is a well-designed and uncomplicated program with some very useful features. Music students especially will find it a worthwhile investment.◀

Program: Musicpen Music Editor
Micro: BBC B
Price: £28.75
Supplier: Dinosaur Software, 41 Cheney Way, Chesterton, Cambridge CB4 1UE 0223 322244

The Acorn Music 500 system has now been expanded by the addition of new hardware and software which, among other function, permits MIDI interfacing and much more sophisticated composition techniques.

Music 500 is a digital synthesiser which can be controlled by a special music composition language, AMPLE The language not only enables you to define complex sounds, but also to compose tunes of great complexity The Music 500 has stereo sound outputs and comes as a free-standing unit.

The latest additions to the system are the Music 400 keyboard and the Music 200 upgrade unit. The keyboard is a full-size four octave device which can be used in all music writing functions, while the Music 200 interface contains an upgraded NUCLEUS operating system on a 16K ROM. The ROM software offers several improvements to the original operating system, including such feature as instrument libraries.◀

Hybrid Technology, Unit 3, Robert Davies Court, Nuffield Road, Cambridge CB4 1TP. 0223 316910.

C things differently

Leon Heller kicks off our series on computer languages with an introductory article on C

Until comparatively recently C has had a reputation for being something of a 'cult' language used mainly under the Unix operating system on minicomputers like the PDP-11 by people in university computer science departments Being a fairly simple concise language, C can be implemented quite easily on micros even low-cost home computers which are not very different in terms of power and memory capacity from the minicomputers on which it was first developed

The history of C

Like a lot of other good things (such as the transistor) C comes from AT & T Bell Labs in the US The language has a British ancestry in that it is based on BCPL a language developed at the Cambridge University Computer laboratory which is still in use today

Dennis Ritchie at Bell Labs, first designed a language called B which was quite close to BCPL This was further developed into C, as we know it today In fact for a brief period the language was called NB standing for Not B!

The C philosophy

C is a general-purpose progamming language which encourages the writing of concise efficient programs. The actual language itself is quite small, with most of the functions (such as Input/Output) that are part of other languages provided in the form of a library C is often used as a systems programming language for writing operating systems (Unix is written in C) compilers (most C compilers are written in C) text editors etc and has been described as a low-level high-level language in that it allows the programmer to operate directly on bytes numbers and machine addresses However since most implementations have floating point, and allow complex data structures to be manipulated with ease, C is also ideal for so-called applications programming – accounting packages stock control etc

How the language is implemented

C is usually implemented as a ' compiler ', that is, a program (source code) is translated by the C compiler into machine code (object code) which may then be executed Interpreters like Basic take the program, a statement at a time check each statement to make sure it is valid according to the rules of the language and then execute it, usually by a call to a machine language subroutine Since compilers check the program only once at the compilation stage compiled programs run much faster than interpreted programs

Some C compilers translate the program into assembly language which is then assembled generating object code, and so-called relocatable object modules are often produced These are then linked with a library to produce an executable program but the end result is the same – a stand alone machine language program Compiled programs typically run very much faster than interpreted programs, and have the added advantage that the code cannot be broken into by the user and modified without a great deal of trouble Copy protection is also much easier to achieve

Programming in C

C programs are built-up from functions (which may or may not return a value) which are similar to subroutines A program must contain one function, where execution commences which is called ' main Main usually calls other functions either in the same program or in external libraries here is a simple program

```
/* a simple program */
#include <stdio h>
main()
{
	puts ( A simple program )
	exit (0)
}
puts(s)
char s[]
{
	int i
	i = 0
	while (s[i] !  \0 )
		putchar(s[i++])
```

The first line is a comment. Comments are enclosed by "/*" and "*/" and may be placed anywhere in a program and may extend over several lines The second line is an instruction to the pre-processor (a program that runs before the compiler) to include the header file stdio h

This header file usually contains definitions of constants variables and macros used by the I/O library All instructions to the pre-processor are prefixed by a hash sign

Next comes the main function which has no parameters hence the empty brackets The body of the function is enclosed in braces (curly brackets) and the

continued over the page ▶

first statement outputs the string "A simple program" and the second statement results in the termination of the program via the library function exit

The zero parameter means that no error code is to be passed back to the operating system. Each statement in C is terminated by a semi-colon. Several statements may be placed on a line although this is usually regarded as bad practice by most C afficionados as it can make programs difficult to read

Although a *puts* function is provided with most compilers, there is nothing at all to stop you writing your own, which we have done here. This time, the function does have a parameter, the character array (which is how strings are represented in C) called *s*

Strings are terminated by a null byte represented by *\0*, so the *puts* function keeps outputting characters from the string until the terminating null byte is reached. *i++* is the same as *i = i + 1*, which could have been used instead. There are many other concise ways of doing things in C

C is a "typed" language in that all variables must be declared to the compiler before use as integer, floating point, character etc

Experienced C programmers tend to use 'pointers', which are variables that contain the addresses of other variables rather than array subscripts, as in the *above example. The puts* function may be re-written using pointers as

```
puts(s)
char *s
{
    while (*s) putchar(*s++)
}
```

This will probably generate more efficient code and is more concise, if harder to understand. Other useful features of the language are that variables (like *i* in the first example) defined within a function are "local" to that function, and may be used elsewhere without any problems

Variables defined outside any function are "globals". C allows you to put various different data items, such as a *person's* name, address and age into one "structure" and deal with it as a single entity – very useful for commercial programming

More about C

Whatever other books you get, a copy of *The C Programming Language* by Kernighan and Ritchie (usually abbreviated to K & R) is essential although it is rather expensive. It's very well written and is still the best book for learning the language. Sunshine Publications, the publisher of this magazine, also have a book out currently, called *The C Compendium* by David Lawrence and Mark England (£12.95), for both beginners and those wishing to expand their knowledge

Buyers' Guide

Program *Hisoft C* **Micro** Spectrum **Price** £25.00 **Supplier** Hi-Soft, 180 High St, Dunstable Bedfordshire Tel (0582) 696421

Program *Super C* **Micro** Commodore 64 **Price** £64.95 **Supplier** First Publishing, Unit 20B, Horseshoe Park, Horseshoe Rd, Pangbourne Berks Tel (07357) 5244

Program *Hisoft C* **Micro** Amstrad disc (or any CP/M Z80 based system) **Price** £39.95 **Supplier** Hi-Soft, 180 High St, Dunstable, Bedfordshire Tel (0582) 696421

Program *Lattice C Compiler* **Micro** Atari ST **Price** £99.95 **Supplier** Metacomco, 26 Portland Square, Bristol BS2 8RZ Tel (0272) 428781

Program *GST C Compiler* **Micro** Atari ST **Price** £59.00 **Supplier** Electric Software, Unit 8, Cromwell Business Centre, New Rd, St Ives Tel (0480) 66433

Program *Lattice C Compiler* **Micro** QL **Price** £99.95 **Supplier** Metacomco, 26 Portland Square, Bristol BS2 8RZ Tel (0272) 428781

Program *GST C Compiler* **Micro** QL **Price** £59.95 **Supplier** Electric Software, Unit 8, Cromwell Business Centre, New Rd, St Ives Tel (0480) 66433

Program *Lattice C Compiler* **Micro** Commodore Amiga **Price** £129.95 **Supplier** Metacomco, 26 Portland Square, Bristol BS2 8RZ Tel (0272) 428781

ADDRESS MASTER

by B Baxter

This is the second and final part of the Address Master program, started last week. As stated last week, the program is set up for cassette storage and Epson printer but feel free to tweak it to suit your individual requirements!

Tape copies are available at a cost of £2.50 from the author. Write to PO Box 17, Burnham on Sea, Somerset TA8 1DT.

Program Notes
Line No
10 – 350 Initial Set Up and Menu
360 – 830 Instructions
840 – 1090 Create New List
1100 – 1210 Keyboards Input
1220 – 1430 Alphabetical Sort
1440 – 1570 Add New Name & Address
1580 – 1750 Delete New Name & Address
1760 – 2130 Search Routine
2140 – 2300 Printer Output Routine
2310 – 2480 Save List to Cassette
2490 – 2690 Load Cassette List
2700 – 2800 End Routine
2810 – 2950 Output to Labels
2960 – 3130 Output to Labels

String & Variables
N$ – Name String
A$ – Address Strings 1-4
E$ – End of File Marker
A$ – Response String
K$ – Response String Return
P$ – Filename String
Q$ – Quotes String
C – File Counter
M – Number of Entries
#8 – Printer Stream
#9 – Cassette Stream

```
1570 REM ***************************
1580 REM * 4. Delete Name & Address *
1590 REM ***************************
1600 REM
1610 CLS:PRINT"* DELETE NAME & ADDRESS *":PRINT
1620 IF C=0 THEN PRINT"List Empty...":FOR T=0 TO 1200:NEXT T:RETURN
1630 PRINT"* Enter Name to be deleted from List exactly as stored  *":PRINT
1640 GOSUB 1100: REM KEYBOARD ROUTINE
1650 Q$=P$
1660 C=1: REM SET COUNTER
1670 IF N$(C)=Q$ THEN 1700
1680 IF N$(C)=E$ THEN PRINT:PRINT Q$;" NOT ON FILE":FOR T=0 TO 850:NEXT T:RETURN
1690 C=C+1:GOTO 1670
1700 N$(C)=N$(C+1):A1$(C)=A1$(C+1):A2$(C)=A2$(C+1):A3$(C)=A3$(C+1)
1710 A4$(C)=A4$(C+1)
1720 C=C+1:IF C=M THEN CLS:PRINT:PRINT Q$" Deleted  ":FOR T=0 TO 800:NEXT:RETURN
1730 GOTO 1700
1740 REM
1750 REM ********************
1760 REM * 5. Search Routine *
1770 REM ********************
1780 REM
1790 CLS
1800 PRINT"* SEARCH ROUTINE *":PRINT
1810 IF C=0 THEN PRINT"List Empty...":FOR T=0 TO 1200:NEXT T:RETURN
1820 C=1: REM SET COUNTER
1830 PRINT:PRINT"Enter Name... ";
1840 GOSUB 1100
1850 GP$=P$
1860 L=LEN(GP$)
1870 IF N$(C)=E$ THEN RETURN
1880 FOR K=1 TO (LEN(N$(C))-L+1)
1890 IF GP$=MID$(N$(C),K,L) THEN 1920
1900 NEXT K
1910 C=C+1: GOTO 1870
1920 CLS
1930 PRINT:PRINT"Name      ";N$(C)
1940 PRINT:PRINT"Address   ";A1$(C)
1950 PRINT"            ";A2$(C)
1960 PRINT"            ";A3$(C)
1970 PRINT"            ";A4$(C)
1980 PRINT:PRINT:PRINT"* Press  P  for Printout *"
1990 PRINT:PRINT"* Press  M  for Menu *"
2000 LOCATE 1,25:PRINT"Press Space Bar to continue search ..."
2010 A$=INKEY$:IF A$="" THEN 2010
2020 IF A$="P" THEN GOSUB 2060
2030 IF A$="M" THEN RETURN
2040 IF A$=" " THEN C=C+1:GOTO 1870
2050 GOTO 2010
2060 PRINT #8, N$(C)
2070 PRINT #8,A1$(C)
2080 PRINT #8,A2$(C)
2090 PRINT #8,A3$(C)
2100 PRINT #8,A4$(C)
2110 RETURN
2120 REM
2130 REM ********************
2140 REM * 6. Printer Output *
2150 REM ********************
2160 REM
2170 CLS:PRINT"* PRINTER OUTPUT *":PRINT:PRINT
2180 PRINT:PRINT" 0. Instructions..":PRINT
2190 PRINT:PRINT" 1. Output Address List..":PRINT
2200 PRINT:PRINT" 2. Output to Labels  ":PRINT
2210 PRINT:PRINT" 3. Return to Menu  ":PRINT
2220 PRINT
2230 PRINT:PRINT"Select Option...."
2240 A$=INKEY$:IF A$="" THEN 2240
2250 IF ASC(A$)<48 OR ASC(A$)>51 THEN 2170
2260 OPT=ASC(A$)-47
2270 ON OPT GOSUB 2790,2840,2960
2280 RETURN
2290 REM
2300 REM ****************
2310 REM * 7. Save List *
2320 REM ****************
2330 REM
2340 CLS:PRINT"    *  CASSETTE SAVE LIST ROUTINE  *":PRINT
2350 PRINT:PRINT"ARE YOU SURE..."  (Y/N)"
2360 A$=INKEY$:IF A$="" THEN 2360
2370 IF A$="N" THEN 160
2380 IF A$<>"Y" THEN 2360
2390 PRINT:PRINT"Enter new Filename please.."
2400 GOSUB 1100: REM KEYBOARD ROUTINE
2410 B$=CHR$(34)+P$+CHR$(34): REM GET "Filename"
2420 IF P$="" THEN B$=""
2430 C=1:OPENOUT B$
2440 IF N$(C)=E$ THEN CLOSEOUT: RETURN
2450 WRITE #9,N$(C),A1$(C),A2$(C),A3$(C),A4$(C): REM OUTPUT DATA
2460 C=C+1:GOTO 2440
2470 REM
2480 REM ****************
2490 REM * 8. Load List *
2500 REM ****************
2510 REM
2520 CLS:PRINT"    *  CASSETTE LOAD LIST ROUTINE  *":PRINT
2530 PRINT:PRINT"ARE YOU SURE..."  (Y/N)"
2540 A$=INKEY$:IF A$="" THEN 2540
2550 IF A$="N" THEN 160
2560 IF A$<>"Y" THEN 2540
2570 PRINT:PRINT"Enter Filename of List Please..."
2580 GOSUB 1100: REM KEYBOARD ROUTINE
2590 B$=CHR$(34)+P$+CHR$(34): REM GET "Filename"
2600 IF P$="" THEN B$=""
2610 C=1:OPENIN B$
2620 WHILE NOT EOF: REM LOOP UNTIL DONE
2630 INPUT #9,N$(C),A1$(C),A2$(C),A3$(C),A4$(C): REM GET DATA
```

Programming: Amstrad

```
2640 C=C+1:GOTO 2620
2650 WEND
2660 CLOSEIN
2670 N$(C)="":RETURN: REM CLOSE UP AND G
O HOME
2680 REM
2690 REM ***************
2700 REM * End Program *
2710 REM ***************
2720 REM
2730 CLS:PRINT"* END PROGRAM *":PRINT
2740 MODE 1:PRINT:PRINT"WARNING.........
"
2750 PRINT:PRINT"IS ALL YOUR DATA SAVED
.. ? (Y/N)"
2760 A$=INKEY$:IF A$="" THEN 2760
2770 IF A$="N" THEN RETURN
2780 IF A$="Y" THEN END: REM GOOD BYE.
2790 REM
2800 REM ************************
2810 REM * Output Address List *
2820 REM ************************
2830 REM
2840 CLS:PRINT:PRINT"* OUTPUT ADDRESS LI
ST *":PRINT
2850 IF C=0 THEN PRINT List Empty...":FO
R T=0 TO 1200:NEXT T:RETURN
2860 PRINT "Set Printer to Top of Paper"
:PRINT
2870 LOCATE 3,25:PRINT"Press Space Bar t
o continue.."
2880 A$=INKEY$:IF A$="" THEN 2880
2890 IF A$<>" " THEN 2880
2900 C=1
2910 IF N$(C)="" THEN PRINT #8,"Total:
";C-1:PRINT #8,CHR$(12)CHR$(12):RETURN
2920 PRINT #8, N$(C);"  ";A1$(C);"   ;A2
$(C);"  ";A3$(C);"  ";A4$(C)
2930 C=C+1:GOTO 2910
2940 REM
2950 REM **********************
2960 REM * Output to Labels *
2970 REM **********************
2980 REM
2990 CLS:PRINT:PRINT"* OUTPUT TO LABELS
*":PRINT
3000 IF C=0 THEN PRINT"List Empty...":FO
R T=0 TO 1200:NEXT T:RETURN
3010 PRINT "Set Printer to Top of Label"
:PRINT
3020 LOCATE 3,25:PRINT"Press Space Bar t
o continue.."
3030 A$=INKEY$:IF A$="" THEN 3030
3040 IF A$<>" " THEN 3030
3050 C=1: REM SET COUNTER
3060 IF N$(C)="" THEN RETURN
3070 PRINT #8,N$(C)
3080 PRINT #8,A1$(C)
3090 PRINT #8,A2$(C)
3100 PRINT #8,A3$(C)
3110 PRINT #8,A4$(C)
3120 FOR SP=1 TO 3:PRINT #8, CHR$(13):NE
XT SP: REM SET SP COUNT FOR SPACE BETWEE
N LABELS
3130 C=C+1:GOTO 3060
```

Programming: C64

PROTECTOR

by David Shaw

My Protector program for the CBM 64 addresses the less publicised but still important area of the piracy of programming methods.

While Protector does not provide protection from copying, it completely hides any Basic or Basic and machine code program producing a version that will list simply as one *SYS* call.

To reveal the actual program is probably impossible without a reasonable knowledge of machine code and how Basic is stored in memory. Despite listing as one *SYS* call, the program can be run and saved as normal once protected.

To further increase the usefulness of the program I have included run/stop-restore and hardware reset switch protection (the reset protection is only present for programs under 32K long). Once run the program is almost unstoppable and when used in conjunction with one of the many published auto-run routines, protection of commercial quality can be achieved.

To protect a program use the following steps:

1) Type in or load up a saved copy of the PROTECTOR listing and RUN it.

2) Type in or load the program.

3) Add the following two lines to the program (they *must* be line numbers zero and one and *must* contain no spaces). It is vital that line one contains 67 asterisks, so count carefully or the routine will not work.

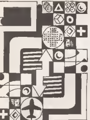
0 SYS2063

1"***" etc. up to 67 asterisks

4) Enter *Sys49152* in direct mode to execute the protection routine and a message will appear telling you the program is now fully protected.

It is advisable to save the protected program at this point because once run you will be unable to break out of the program.

```
10 REM * * * * *PROTECTOR* * * * *
20 REM *        DAVID  SHAH        *
30 REM * * * * *BUCKINGHAM* * * * *
40 FORT=0TO194:READA:CS=CS+A:POKE49152+T,A:NEXT
50 IFCS<>18014THENPRINT"DATA ERROR":END
100 DATA162,0,189,35,192,232,157,14,8
101 DATA224,67,208,245,169,0,141,11,8
102 DATA141,12,8,162,0,189,102,192,32
103 DATA210,255,232,224,93,208,245,96
104 DATA164,46,192,128,16,35,169,195,141
105 DATA4,128,169,194,141,5,128,169,205
106 DATA141,6,128,169,56,141,7,128,169
107 DATA48,141,8,128,169,70,141,0,128
108 DATA169,8,141,1,128,169,193,141,24
109 DATA3,169,254,141,25,3,169,83,133
110 DATA43,169,234,141,40,3,32,89,166
111 DATA76,174,167,0,32,84,72,69,32,80
112 DATA82,79,71,82,65,77,32,73,83,32
113 DATA73,79,87,32,70,85,76,76,89,32
114 DATA80,82,79,84,69,67,84,69,68,33
115 DATA33,32,32,32,84,82,89,32,76,73
116 DATA83,84,46,83,65,86,69,32,65,78
117 DATA68,32,82,85,78,32,84,72,69,32
118 DATA80,82,79,84,69,67,84,69,68,32
119 DATA80,82,79,71,82,65,77,32,65,83
120 DATA32,85,83,85,65,76,46
130 NEW
```



SLOW DOWN

by D Bridge

Risking being described perverse this routine is designed to slow the QL. The impetus for writing it came from the purchase of additional memory which I was pleased to find speeded the QL by some 20%, but in doing so moved some arcade games out of the category of "challenging" and into that of "too (blast-ed) difficult".

Software techniques for slowing a micro usually rely on introducing delays in the interrupt service routines. However, for multitasking machines another method may be used: that of creating an independent job able to adjust its own priority to "steal" processor time from all other jobs (and therefore to slow them).

The routine examines either the F5 or / key and when pressed cycles through eight different preset priorities, issuing a beep or pitch related to that priority – a low pitch corresponding to the routine itself having a high priority and therefore to all other tasks running slowly.

The range of speeds achieved (and keyboard response) will depend on the priorities and status of the other jobs, but assuming a single other (activated and not awaiting input) at its default priority of 32 (which is usually appropriate), then the new QL speeds are approximately 97%, 88%, 80%, 70%, 60%, 50%, 40% and 25%.

Although not impossible to disable the routine works on all of the games software I own (as well as basic and utilities). When done the routine should be *Execed*.

Once any program is *Execed* (ie, the transient program area is no longer empty) then the resident procedure area can not be expanded. Therefore you must *Exec* the routine *after* any required *Respres* have been carried out.

```
REMark ****** SLOW IT ******
REMark ***** D BRIDGE *****
CLS:AT 2,0:PRINT "PLEASE WAIT":PRINT
ADDR=RESPR(200):POS=ADDR
LINE_NO=1000:LINE_STEP=10:FLAG=0
RESTORE LINE_NO
:
REPeat OUTER
 SUM=0:COUNT=0
 REPeat INNER
  COUNT=COUNT+1
  IF EOF THEN EXIT INNER
  READ A
  IF COUNT<11 THEN
   POKE POS,A:POS=POS+1:SUM=SUM+A
  ELSE
   IF SUM<>A THEN PRNT_ERROR
  EXIT INNER
  END IF
 END REPeat INNER
 IF EOF THEN EXIT OUTER
 LINE_NO=LINE_NO+LINE_STEP
END REPeat OUTER
IF (SUM-A-A)<>0 THEN IF COUNT<>11 THEN PRNT_ERROR
340 IF NOT FLAG THEN
350   INPUT "SELECT KEY  1= F5   2= /  ";A$
360   IF A$="2" THEN POKE (ADDR+112),1
370   PRINT "SAVING CODE"
380   SEXEC MDV1_SLOW_IT_TST ,ADDR,140,100
390 END IF
400 STOP
410 DEFine PROCedure PRNT_ERROR
420 FLAG=1:PRINT "CHECKSUM ERROR AT LINE ";LINE_NO
430 END DEFine PRNT_ERROR
1000 DATA 74,12,0,0,0,0,74,251,0,4,437
1010 DATA 83,76,79,87,116,1,114,255,112,11,934
1020 DATA 78,65,67,250,0,104,174,0,71,250,1011
1030 DATA 0,74,112,17,78,65,8,1,0,5,362
1040 DATA 103,242,82,6,2,134,0,0,0,7,576
1050 DATA 71,250,0,62,23,70,0,6,82,43,607
1060 DATA 0,6,112,17,78,65,69,241,104,8,700
1070 DATA 116,0,20,18,114,255,112,11,78,65,789
1080 DATA 67,241,104,0,122,0,26,18,62,60,702
1090 DATA 1,144,78,117,81,207,255,252,81,205,1417
1100 DATA 255,244,96,0,255,10,9,1,0,0,1040
1110 DATA 0,0,0,2,10,8,0,0,170,170,360
1120 DATA 1,0,0,0,0,5,0,0,1,0,7
1130 DATA 2,35,65,95,135,142,160,200,1,4,829
1140 DATA 8,14,21,32,48,96,0,0,219
```






BASIC AID

by Stephen Martin

This is a programming utility for the 48K ZX Spectrum which will aid Basic programmers. It will display in real time (as it happens) the following information:

(1) The most recently plotted X-coordinate

(2) The most recently plotted Y-coordinate

(3) The ASCII code of the last key press, hence *Enter*(13) A(65) etc

(4) The first location of the Basic program (Prog) area.

(5) Current line number being executed (If no program is running it will display zero)

(6) The first location of the user definable graphics area. This is the equivalent of *Print Usr "a"*

(7) The length of your Basic program This is updated after a line is inserted or deleted
(8) The free memory (Ram) remaining. The last two digits may flicker but the first three digits will always be clearly visible
(9) The current value of *Ramtop* This should be at least 64569

As the Panel is interrupt driven, it will use the vector hook at $FEFFFF00 so those programmers who use small patches of code in their Basic programs should take care where they organise their machine code However, there is a small area between 65281 and 65367 vacant Otherwise machine code should be placed so that it ends before 64570

Once installed the panel can be activated by *Rand Usr 64570* and panel is switched off by *Rand Usr 64580* In addition to this the routine can also be used in non Interrupt mode by *Rand Usr 64590* (the panel should be switched off before doing this) The routine can also be left in operation when loading a new Basic program As the Spectrum will disable the routine, then once loading has commenced it will re-enable the panel

Note that when editing program lines thick dotted lines may appear on the upper third of the screen below the panel These should be removed by a CLS command The effect of these lines is purely cosmetic and does not interfere with the operation of the foreground or background task

Naturally before any of this happens the machine code for the utility must be entered! First *Rand Usr 0* to clear the memory Then *Clear 64569*

Listing 1 should now be entered and run (this is the loader) On running the program will ask for a start address Enter 64570 & press *Enter* Next you will be asked the length Enter 700 Enter the first number from the code dump, and repeat this process until you are asked for the checksum Enter this and if all is well the next base location 64575 will be displayed and you should continue in a similar fashion until all the code has been entered

If an error occurs then you will be returned by the program to the current base address again

Having completed your task the code should be saved thus *Save INT-PAN Code 64570 700* Once saved the code should be verified Now the moment of (interrupt driven) truth *Rand Usr 64570* And if all is well nine pieces of information should be displayed

```
10 REM CODE LOADER
20 CLS : INPUT "START LOCATION ";START
30 INPUT "LENGTH OF CODE ";LENC
40 LET LEN=LENC-1
50 FOR i=START TO START+LEN STEP 5
60 LET c=0
70 PRINT i;" ";
80 PRINT TAB 7;
90 FOR j=0 TO 4
100 LET a$=STR$ (i+j)
110 INPUT "position ";a$;" = ";code
120 POKE i+j,code
130 PRINT code;" ";
140 LET c=c+code
150 NEXT j
160 INPUT "check number ";cn
170 IF c<>cn THEN PRINT "error": GO TO 60
180 PRINT " ";cn
190 NEXT i
200 BEEP 1,50
210 PRINT CHR$ 17;CHR$ 3;"CODE COMPLETED "
```

code dump

```
64570  33 75 252 34 255    139
64575  254 52 254 237 71   175
64580  237 94 251 62 65    131
64585  237 71 237 88 251   186
64590  229 213 197 245 1   177
64595  151 254 22 10 33    64
64600  1 64 34 238 254     116
64605  205 237 253 1 181   171
64610  254 22 10 33 33     70
64615  64 34 235 254 205   159
64620  237 253 1 171 254   183
64625  22 10 33 65 64      39
64630  34 238 254 205 237  193
64635  253 1 181 254 22    149
64640  10 33 12 64 34      39
64645  235 254 205 237 253 237
64650  1 191 254 22 10     95
64655  33 40 64 34 238     52
64660  254 205 237 253 1   199
64665  201 254 22 10 33    184
64670  75 64 34 238 254    133
64675  205 237 253 1 211   181
64680  254 22 9 33 93      68
64685  64 64 238 254 205   159
64690  237 253 1 220 254   193
64695  22 9 33 55 64       38
64700  34 238 254 205 237  193
64705  253 1 229 254 22    181
64710  9 33 87 64 34       45
64715  238 254 205 237 253 237
64720  62 125 93 58 0      68
64725  111 205 53 254 205  158
64730  199 253 1 148 254   171
64735  22 3 33 6 64        25
64740  34 238 254 205 237  193
64745  253 55 126 92 35    113
64750  0 111 205 53 254    124
64755  205 199 253 1 148   181
64760  254 22 3 33 40      70
64765  64 34 238 254 205   159
64770  237 253 58 8 92     189
64775  38 0 111 205 53     61
64780  254 205 199 253 1   182
64785  148 254 22 3 33     92
64790  72 64 34 238 254    132
64795  205 237 253 42 93   154
64800  92 205 53 254 205   181
64805  199 253 1 148 254   179
64810  22 6 33 17 64       28
64815  34 238 254 205 237  193
64820  253 42 83 92 58     182
64825  78 92 254 255 32    149
64830  3 33 6 9 205        46
64835  53 254 205 199 253  195
64840  1 148 254 22 5      85
64845  33 49 64 34 238     83
64850  254 205 237 253 65  198
64855  123 92 205 53 254   145
64860  205 199 253 1 148   188
64865  254 22 5 33 81      79
64870  64 34 238 254 205   159
64875  237 253 42 65 92    141
64880  54 93 42 75 92      77
64885  237 59 205 53 254   158
64890  205 199 253 1 148   158
64895  254 22 5 33 97      68
64900  64 34 235 254 205   159
64905  237 253 205 118 254 218
64910  50 68 53 255 255    142
64915  237 82 205 53 254   155
64920  205 199 253 1 148   159
64925  254 22 8 33 59      74
64930  64 64 238 254 225   159
64935  237 253 42 178 92   159
64940  205 53 254 205 188  183
64945  253 1 140 254 22    155
64950  5 33 81 64 34       45
64955  238 254 205 237 253 237
64960  241 193 229 205 195 218
64965  56 0 38 46 58       30
64970  148 254 131 58 148  145
64975  254 58 147 254 131  186
64980  58 147 254 58 148   131
64985  254 131 58 148 254  187
64990  58 149 254 131 58   186
64995  148 254 58 150 254  173
65000  131 58 150 254 201  187
65005  175 245 10 245 197  174
65010  213 229 205 2 254   180
65015  225 209 193 241 3   174
65020  81 241 185 32 237   143
65025  201 111 58 0 41     78
65030  41 41 17 0 58       31
65035  95 237 91 232 254   169
65040  5 0 185 10 35       35
65045  28 15 200 122 15    84
65050  15 15 61 238 3      84
65055  246 88 87 33 71     105
65060  0 35 173 194 173    197
65065  10 33 238 254 52    118
65070  192 35 125 198 8    111
65075  119 201 175 17 16   185
65080  32 237 82 50 40     95
65085  251 88 61 58 148    188
65090  254 175 17 200 0    136
65095  237 82 58 48 251    135
65100  25 61 58 147 254    187
65105  175 17 100 0 237    195
65110  62 58 48 251 85     83
65115  61 58 148 254 175   137
65120  17 10 0 237 82      69
65125  62 48 251 25 61     69
65130  95 149 254 175 100  158
65135  58 150 254 201 1    131
65140  0 0 205 124 254     115
65145  55 77 201 42 181    97
65150  92 0 219 142 254    143
65155  235 33 88 0 25      74
65160  218 142 254 237 114 193
65165  216 33 0 0 251      98
65170  54 62 53 54 57      54
65175  80 45 99 111 114    91
65180  100 50 32 52 32     58
65185  55 65 98 111 114    91
65190  100 55 32 32 32     58
65195  76 97 115 115 65    59
65200  76 55 32 32 32      45
65205  80 114 111 109 58   93
65210  32 33 32 32 32      32
65215  75 105 110 101 58   98
65220  32 32 32 32 32      32
65225  55 100 103 115 58   92
65230  32 32 32 32 32      32
65235  78 101 116 58 32    75
65240  32 32 32 32 72      39
65245  114 101 58 32 32    87
65250  32 32 32 84 111     58
65255  112 58 32 32 32     53
65260  32 32 98 84 201     55
65265  0 0 0 0 0           0
```




MARBLE MANIA

by Shawn McAvery

This week the bulk of the main listing for Marble Mania – also included is the extra data for screens four to six for when you've truely mastered the first three!

As before – lesser hearts can obtain tape copies of the program from the author at a cost of £3.00. Write to him at 83 Tipner Road Stamshaw Portsmouth, Hants, PO2 8OP. Note that in the Data statements, enter the single quote marks as pound signs (replace ' with £)

```
  850 COLOUR3:FORN=2TO17:FORM=1TO18:PRIN
TTAB(M-1,17);M$(M,N);:NEXT,
  860 FORN=25TO50STEP5:SOUND1,-9,N*2,1:S
OUND1,-9,N,1:NEXT
  870 COLOUR1:VDU24:A=0:B=0:Y=784:RETURN

  880 DEFPROCtime
  890 TM=240
  900 FORN=200TO150STEP-5:SOUND1,9,N,1:N
EXT
  910 VDU4:L=L-1:IF L<1 THEN GOTO 730
  920 FORN=1TOL:PRINTTAB(27+N,4);CHR$254
;" ":NEXT:VDU5:GOTO 470
  930 CLS:A=0:B=0:X=640:Y=500
  940 VDU20
  950 GCOL 0,1
  960 FORN=0TO1280STEP64:MOVEN,0:DRAWN,8
96:MOVE0,N:DRAW1280,N:NEXT
  970 GCOL 1,3
  980 MOVE 0,0:DRAW 1279,0:DRAW 1279,896
:DRAW 0,896:DRAW0,0
  990 PRINTTAB(0,1)"To go back to the ma
in menu just guide  the ball off the gri
d."
 1000 GCOL3,3:VDU5
 1010 MOVEX,Y:VDU254
 1020 MOVEX,Y:VDU254:X=X+A:Y=Y+B:MOVEX,Y
:VDU254
 1030 A=A+(INKEY(-98) AND A>-12)-(INKEY(
-67) AND A<12)
 1040 B=B+(INKEY(-105) AND B>-12)-(INKEY
(-73) AND B<12)
 1050 IF (X<0 OR X>1280) OR (Y<0 OR Y>89
6) THEN GOTO 90
 1060 PROCslow
 1070 GOTO 1020
 1080 *FX15
 1090 A=GET:CLS:SC=INT SC
 1100 IF SC>H(4) THEN H=4
 1110 IF SC>H(3) THEN H=3
 1120 IF SC>H(2) THEN H=2
 1130 IF SC>H(1) THEN H=1
 1140 IF SC<=H(4) THEN GOTO 90
 1150 FORN=4TOH STEP-1:H(N)=H(N-1):H$(N)
=H$(N-1):NEXT:H(H)=SC
 1160 FORN=0TO255STEP32:SOUND1,-15,N/2,2
:SOUND1,-15,128+N/2,1:NEXT
 1170 PRINTTAB(3,5)"* C O N G R A T U L
A T I O N S *";TAB(9,15)"YOU HAVE SCORED
 : ";SC;TAB(10,20)"WHAT IS YOUR NAME ?"
 1180 *FX15,1
 1190 VDU 23,1,1;0;0;0;:INPUTTAB(10,25)"
> "N$:VDU 23,1,0;0;0;0;
 1200 IF LEN N$>15 THEN VDU7:PRINT  "YOU
 HAVE ONLY SPACE FOR FIFTEEN LETTERS"  "
PLEASE ENTER AGAIN......PRESS A KEY.":A=
GET:CLS:GOTO 1160
 1210 SOUND1,-11,255,1:H$(H)=N$:GOTO 90
 1220 DEFPROCslow:Z=TIME:REPEAT:UNTILTIME
=Z+9:ENDPROC
 1230 DATA624,5
 1240 DATA"PQRDE BTUVCDUVST"
 1250 DATA"BBUZSTBBBDYZCDEF"
 1260 DATA"BBEFCDBBBBEFAR  "
 1270 DATA"BBUVA NOGHI AXTU"
 1280 DATA"CDEF^JJRJ[[IACDE"
 1290 DATA"ZA MJJR AJ[[\AA '
 1300 DATA"FXTFQRSTYZJKLYZ "
 1310 DATA"TBRGHICDEFACDBBU'
 1320 DATA'BEFJ[[\A' AXWBBE"
 1330 DATA'HI AJKLYVSWBBEFS'
 1340 DATA'[[IXWBBEFCDBBUVC"
 1350 DATA"JKLBDBBUV4ACDBBY'
 1360 DATA"ACDEFCDGH\AA^NDE'
 1370 DATA"YWYV AAJKLYWPQR "
 1380 DATA'BBEFSWYZCDBBEFST"
 1390 DATA"DBUTBBEFXWBBUVCD'
 1400 DATA"XWBBEF MNOBBGH\A"
 1410 DATA"BBEF 'MJJRCFJKLY'
 1420 DATA"EF'  MIJR'A ^NDE"
 1430 DATA"   BTPQR  AMJJR "
 1440 DATA"UV'CDGHI '^JJRST"
 1450 DATA"BBUZAJKLUTPQR CD"
 1460 DATA"BBEFACDBBBBUVAA"
 1470 DATA"EFSTYZAACDBBBBYZ'
 1480 DATA'STBBBBYZAACDBBBB"
 1490 DATA'BBEFCDBBYZXWBBEF'
 1500 DATA"BBUVXWBBEFCDBBUV"
 1510 DATA'BBEFCDBBUVXWBBEF'
 1520 DATA'GHI XWBBBBBBBBUV"
 1530 DATA"[[[ICDEFCDEFCDEF"
 1540 DATA'[[[[\A  AASTYZST'
 1550 DATA'[[[[[\  XWBBBBBB"
 1560 DATA448,2
 1570 DATA"BBGHICDBBBBEF^\A"
 1580 DATA'GH[[[\^NOEF'MJ[\"
 1590 DATA"[[[[KLPQR  MJJ[['
 1600 DATA'[[KLGBEF  MJJJ[["
 1610 DATA"KLBBBBUVSTPQJJ[['
 1620 DATA'CDEFCDBBBBEDPQKL"
 1630 DATA"AA  A^NOGHIACDEF'
 1640 DATA"AA  ^JJJ[[[\AA '"
 1650 DATA'YZSTPQJJ[[KLYZST'
 1660 DATA'EFCDBBPQKLBBEFCD'
 1670 DATA"UVXWBBGHNDBBUVXW'
 1680 DATA'BBBBEFJ[JRCDBBBB'
 1690 DATA'BBBBUVAJR XWBBBB"
 1700 DATA'EFCDBBYZSTBBEFCD"
 1710 DATA" M\ACDBBBBEF M\A'
 1720 DATA"MJ[\XWBBBBUVMJ[\'
 1730 DATA"FQKLBBGHNDBBPQKL"
 1740 DATA"EFCDGH[[JJNDEFCD"
 1750 DATA"UVAAJ[[[JJR  XW'
 1760 DATA"EF'\AJKLPQR MICD"
```

```
1770 DATA"'MJ[\^NOGHIMJ[\A"
1780 DATA"TPQKLPQRJKLPQKLY"
1790 DATA"BBBBEF ACDBBBBB"
1800 DATA"BBBEF STYZACDBBB"
1810 DATA"DBBUV CDEFAXWBBE"
1820 DATA"MNOEF XWUVACDGHI"
1830 DATA"PQR  MNOGH\AAJKL"
1840 DATA"GHISTPQRJKLYZ NO"
1850 DATA"JKLBBBBUWBBBBFQR"
1860 DATA"ZCDEDBBBBBDEDEFS"
1870 DATA"BYZSWBBBBBUZSTB"
1880 DATA"BBBBBBBBBBBBBBBB"
1890 DATA822,1
1900 DATA"STUVSTUVCDEFXWYZ"
1910 DATA"CDBBBBBBYZSTBBEF"
1920 DATA"XWBBEFCDBBBBEF'S"
1930 DATA"CDGHI XZCDEF STB'"
1940 DATA"YZJ[[ICFAXTUVCDB"
1950 DATA"EFAJKLYV^NOBBUZC"
1960 DATA"STYZCDBBPQRCDBBY"
1970 DATA"CDEFA NOEF A NOE"
1980 DATA"XWUV^]]R   ^]]R'"
1990 DATA"BBBBPQR  STPQR S"
```

```
2000 DATA"BBEDEF SVCDBBUVC"
2010 DATA"GHIXTUVCFXZCDBBY"
2020 DATA"JKLBBGH\ CFA^NDE"
2030 DATA"ACDEFJKLUZSWPQR "
2040 DATA"YWYV ACDBBBBEFBV"
2050 DATA"EDBBUZXWBBBBUVCF"
2060 DATA" ACDEFCDBBBBEFA '"
2070 DATA"SWYZ 'A^NOGHI XT'"
2080 DATA"BBBBUV ]]RJ[[ICD'"
2090 DATA"GHNOBBPQR AJ[[\A'"
2100 DATA"J[]]NOBBUVAAJKLY"
2110 DATA"AJ]]]RCDGH\XWBBE'"
2120 DATA"XWPQR AAJKLBBEF "
2130 DATA"CDBBUVAAACDGHI  "
2140 DATA"YZCDBBYZAAAJKLUV"
2150 DATA"EFXWBBEFAAXWBBEF"
2160 DATA"STBBEF' XWBBEFST"
2170 DATA"BBBBUV  CDBBUVCD'"
2180 DATA"EFCDBBUVXWBBBBYZ'"
2190 DATA"STYZCDBBBBEFCDEF"
2200 DATA"BBEFXWBBBBUVAAST"
2210 DATA EFSTBBBBBBBBYZCD"
2220 DATA 0,0
```

```
1230 DATA448,5
1240 DATA"STUV 'CDBHNGHNDB"
1250 DATA"CDGHI'AAJ[][[]][["
1260 DATA"AAJ[[IAAAJRJ[]RJ"
1270 DATA"AAAJ[[\AAA AJR'A"
1280 DATA"WYZAJ[[\AA AA' ^"
1290 DATA"DEFAAJ[[\A AA'M]"
1300 DATA"A  AAAJ[[\'AAM]]"
1310 DATA"A SWYZAJKLUZ^]]R"
1320 DATA"AMNOGH\ACDBBPQR "
1330 DATA"WPQRJKLYZ'NOEFST"
1340 DATA"DGHIACDBBPQR MNO"
1350 DATA"AJ[[\AACDEF M]]]"
1360 DATA"YZJKLYWYZ  M]]]]"
1370 DATA"GH\CDBBBBUTPQ]]]"
1380 DATA"[[[\ACFCDBBEDPQ]"
1390 DATA"[[KLYZ AACF'^NDP"
1400 DATA"KLBBEF AAA M]]]N"
1410 DATA"EDEF STYZXTPQ]]]"
1420 DATA" XTUVCDEFCDBBPQR"
1430 DATA"TBBGH\A 'A^NOEFB"
1440 DATA"BGHI[[\SV^]]R  C"
1450 DATA"H[[[[KLBBPQR  SW"
1460 DATA"[[IKLEDEDEF STBB"
1470 DATA"IKLEF A A   CDBB"
1480 DATA"LGHISTYVA SVA^NO"
1490 DATA"FJKLBBBBYVCF^]]R"
1500 DATA" ACDEFCDGH\M]]R "
1510 DATA"UZAA 'AAJKLPQR S"
1520 DATA"EFAASTYZ^NOEF  C"
1530 DATA" 'A^NOBBPQR' STY"
1540 DATA" '^]]]NDEFSV CDB'"
1550 DATA" M]]]]]R' CF'AAC"
1560 DATA472,2
1570 DATA" STUVSTUV 'CDBBB"
1580 DATA" CDBBBBGHI AACDB'"
1590 DATA" XWBBEFJ[[IAAAAC"
1600 DATA" CDGHI AJKLYZAAA"
1610 DATA"UZAJKLUZACDBBYZA"
1620 DATA"EFAACDBBYZACDBBY"
1630 DATA" SWYZ^NOEFAXWBBE"
1640 DATA"MNOBBPQR  ^NOEF'"
1650 DATA"PQRCDEF 'M]]R  M"
1660 DATA"GHIAA   M]]R 'M]"
1670 DATA"J[[\A STPQR'STPQ"
1680 DATA"AJ[[\ CDBBUVCDBB"
1690 DATA"AAJ[[IXWBBBEFXWBB"
1700 DATA"YZAJKLBBBBUVCDEF"
1710 DATA"BBYZCDEFCDBBYZ' "
1720 DATA"CDEFAA  XWBBBBUV"
```

```
1730 DATA"AA SWYVMNOBBBBEF"
1740 DATA"YZ CDBBPQ]NOEF S"
1750 DATA"EF'XZCDBBPQR STB"
1760 DATA" ' CFAACDBBUVCDB"
1770 DATA" STYVAAXZCDGH\AC"
1780 DATA"TBBBBYZCFAAJ[[\A'"
1790 DATA"BBBEDBBYVAAAJKLY"
1800 DATA"DGHIACDGH\AA NDE"
1810 DATA"AJ[[\AAJ[[\ ]]R'"
1820 DATA"AAJ[[\AAJKLPQR '"
1830 DATA"\AAJKLYZACDGHI  '"
1840 DATA"[\AACDBBYZAJKLUV"
1850 DATA"KLYZAACDGH\ACDEF"
1860 DATA"BBBBYZA [[[\AA' "
1870 DATA"BBBBEF^][[[[\A' "
1880 DATA"BBEF M]][[[[[\''"
1890 DATA592,1
1900 DATA"AA'  STUVA   AA "
1910 DATA"YZ BTBBEFA   AA'"
1920 DATA"EFMNDEF  A   AA'"
1930 DATA" M]]RSTUVASTUZA'"
1940 DATA"M]]R CDEF^NOBBYV"
1950 DATA"PQR  AASTPQRCDBB"
1960 DATA"GHI 'XWBBEF A NO"
1970 DATA"JKLUVCDBBUVSWPQR'"
1980 DATA"^NOEFA^NDEFCDBBU"
1990 DATA"PQR '^]]R 'A NOB"
2000 DATA"BBUVM]]R'  ^]]RC"
2010 DATA"CDBBPQR   M]]R A'"
2020 DATA"YZCDEF  STPQRSTY"
2030 DATA"EFXWUVSTBBEF CDE"
2040 DATA"STBBBBBBEFSTUZA '"
2050 DATA"BBBBBBBBUVCDEFA "
2060 DATA"BBBBBBBBDEFAA 'A "
2070 DATA"BBEFCDGHI AA  XT"
2080 DATA"BBUVAAJKLUZA' CD"
2090 DATA"BBEFAXWBBBBYV AA"
2100 DATA"EF SWBBEFCDBBUZA"
2110 DATA" STBBBBUVXWBBEFA"
2120 DATA"TBBEFCDBBBBEF  A"
2130 DATA"DBBUVXWBBEF  ' A"
2140 DATA"ZCDBBBBEF      A"
2150 DATA"FXWBBEF  STUV' X"
2160 DATA" CDBBUVSTBBBBUTB"
2170 DATA"UZACDBBBBEFCDBBB"
2180 DATA"BBYZACDEF  XWBBE"
2190 DATA"BBGH\AA  STBBEF'"
2200 DATA"GH[[[\ASTBBBBUV "
2210 DATA"[[[[[[\CDBBBBBBU"
2220 DATA 0,0
```

Circle Graphics on MSX
by Charles Bajada

I still cannot understand the lack of articles on MSX considering the fact that many are now realising that this is a system with great potential. I hope this program will encourage MSX users to write routines of their own.

The routine opposite is a graphic demonstration called Circle Graphics. This makes use of the excellent circle command showing some of the great potential of the MSX. A series of circles are drawn in various configurations around the screen, producing some pleasing patterns.

The program can be easily altered by the user to create endless variations.

```
10 COLOR ,1,1
20 FOR C=2 TO15:COLOR C
30 SCREEN 2
40 CLS:FOR I=1 TO 100:CIRCLE(121,95),I,,I/30,I/2
5:NEXTI
50 FOR X=1 TO 500:NEXT:BEEP
60 CLS:FOR I=0 TO 150 CIRCLE(121,95),I/2,,I 5,0:
NEXT I
70 FOR X=0 TO 500:NEXT:BEEP
80 CLS:FORI=0 TO 314STEP2:CIRCLE(SIN(I/25)*60+1
28,COS(I/50)*30+95),10:NEXTI
90 FOR X=0 TO 500:NEXT:BEEP
100 CLS:FOR I=0 TO230:CIRCLE(I*0,0+30,SIN(I/10)*
30+95),10,,2,COS(I/3):NEXT I
110 FOR X=0 TO 500:NEXT:BEEP
120 CLS:FOR I=0 TO 31:CIRCLE(121,140),SIN(I/10)*
100,,2,0:NEXT I
130 FOR X=0 TO 500:NEXT X:BEEP
140 CLS:FOR I=0 TO 200 CIRCLE(SIN(I/10 )*50,SIN(
I/35)*30+95),10:NEXT I
150 FOR X=0 TO 500 NEXT X:BEEP
160 CLS:FOR I=0 TO500 STEP2:CIRCLE(121,I),TAN(I/
70)*10,,I/30,0:NEXT I
170 FOR X=0 TO 500 NEXT X:BEEP
180 CLS:FOR I=0 TO 70 CIRCLE(121,95),I,,1/50,I/1
5:NEXT I
190 FOR X=0 TO 500 NEXT X:BEEP
200 CLS:PI=4*ATN(1):FOR I=0 TO2*PI STEP 1:CIRCLE
(30*I+30,95),40,,2,I:NEXT I
210 FOR X=0 TO 500 NEXT X:BEEP
220 NEXT C
230 GOTO 20
```

Checkboard on Spectrum
by R G Luxton

Checkboard will instantly fill the screen with a checkboard pattern in *Bright* and non-*Bright*. A call to the same *Usr* will then clear it from the screen just as quickly.

Type in and *Run* the program. Enter as a direct command a short print command – say *Print At 10 12 "Popular* – followed by *Enter*. Now enter *Goto g*, followed by *Enter*. Now enter *Goto g*. Leaving characters on the screen, followed by *Enter*. Enter Checkboard work. Again *Goto g*, and the checkboard pattern will clear leaving your message on the screen.

Checkboard can be used as a guide to layout on the screen used directly or incorporated into a *Plot* and *Draw* program. A demonstration routine from Line 2000 shows another use. Enter *Goto 2000* and press any key during each pause.

Also, after Breaking the program *Poke 65315* with any number from 1 to 255 followed by *Goto g*. Leaving characters on the screen as you do so creates an interesting effect.

To use this in your own programs delete Lines 120, 130 and from 2000 to 2050. Enter merge the program into your own or *Run* it, and *Save* with *Code 65304,64*. You should add *Clear 65303* when reloading it, and enter *Randomize Usr 65304* to call or clear the checkboard effect. The program is relocateable.

```
 100 CLEAR 65303
 110 FOR i=65304 TO 65367: READ a: POKE
i,a: NEXT i
 120 LET g=130: STOP
 130 RANDOMIZE USR 65304
1000 DATA 33,0,88,1,96,1,30,32,22,16,62,
64,174,119,35,35,21,40,10,29
1010 DATA 40,12,11,120,177,32,239,43,201
,35,22,16,24,241,43,43,30,32,24,238,43,4
5
1020 DATA 101,51,88,39,237,16,13,0,9,0,1
33,28,16,28,82,27,118,27,3,19,0,62
1030 STOP
2000 BORDER 0
2010 FOR i=64 TO 120 STEP 8
2020 PAPER 7: CLS : POKE 65315,i
2030 PRINT AT 8,9;"P O P U L A R";AT 10,
7;"C O M P U T I N G";AT 12,9;"W E E K L
 Y"
2040 RANDOMIZE USR 65304: PAUSE 0: IF IN
KEY$="s" THEN  STOP
2050 PAPER 0: FOR c=1 TO 22: LET a=USR 3
280: NEXT c: NEXT i: GO TO 2010
```

Colour on Commodore 64
by John Eden

Colour allows you to change all the letters or numbers on the screen to any colour you specify, using the form Sys 50050,0-15.

Try entering this:

For J = 0 to 1 Step 0 For E = 0 to 15 Sys 50050 E Next Next

This will make all the letters on the screen flash continuously.

```
800 FORI=50050TO50083:READZ
802 POKEI,Z C=C+Z NEXT
805 IFC<>6247 THEN PRINT"ERROR"
807 IFC<>6247 THEN PPINT"CHECK"
809 IFC<>6247 THEN LIST 820-
810 PRINT "PROGRAM OPERATING"
815 REM TYPE "SYS 50050,COLOUR"
820 DATA 32,155,183,165,101,162
830 DATA 0,134,252,162,216,134,253
840 DATA 145,252,230,252,166,252,208
850 DATA 2,230,253,224,232,208,242
860 DATA 166,253,224,219,208,236,96
```

Programming: Peek & Poke



Plain sailing

Mrs CP Sargant of Falmouth in Cornwall, writes

Q Is there any software available that would allow programs written for the Sinclair Spectrum to be ran on the Sinclair QL?

The main reason for wanting to use the QL is the fact that the fast loading with microdrives is ideal for use on board my boat

A As far as I know, there is no emulation software that allows a QL to become a Spectrum As a technical possibility this is not too outrageous an idea since the 68000 the microprocessor in the QL, is capable of simulating the Z80, the microprocessor in the Spectrum No doubt someone will write in saying that they have some software to do this. If so, I ll let you know

An alternative that may sound silly is to get a Spectrum with Interface 1 and microdrives They are still available and pretty cheaply too However the Amstrad deal has thrown the question of Sinclair-specific peripherals into turmoil, and their future is by no means assured

Graphic animation

Stan Cooper, of St. Fergus in Aberdeenshire writes

Q I would appreciate your comments on the suitability of equipment which will be capable of satisfying the following needs

1) Building colour graphics programs to illustrate the behaviour of fluids in pipelines and vessels.

2) Designing simulations of industrial processes with graphics and numeric information capable of interaction with the trainee

3) Displaying video pictures of equipment and superimposing animated graphics to illustrate the interior workings

4) Saving the results of (3) on to video tape for use when the computer is not available

5) Creating text and graphics for class handouts. At the moment, I feel that the imminent Commodore Amiga will be a suitable machine. The new Atari 1040ST may also be a possibility

I have decided to limit myself to a spending ceiling of £2000 excluding video camera and would appreciate your advice

A Your biggest problem will be programming and presuming that you can take care of this (not that easy) both the Atari ST and the Commodore Amiga should be able to cope with your needs The graphics capabilities of both machines are excellent with the Amiga being a little better due to its graphics chips

If you want to produce still graphics in colour both machines have graphics packages to allow you to do this When you consider what happened to the standard of similar Macintosh packages, after *MacPaint*, there will be some major improvements over those now available These should allow you to produce simple moving graphics with a minimum of programming using multiple frames displayed in succession

As far as I know, both machines will allow video pictures to be displayed along with their graphics although the Atari ST will need a little external gadgetry to link the horizontal and vertical syncs to those of the camera It may well be that a company will produce this (you can check this with Atari UK on 0753 33444)

Saving pictures to video tape on the Atari ST is not so simple since the machine puts out an RGB signal However, this can be converted into a composite signal – a mixture of red, green blue and sync on one channel as used on most video recorders – with a simple mixer circuit again someone ought to come up with one of these soon The Amiga should cause no problems since it puts out both signals

The creation of handouts should be pretty simple on both machines since all you would have to do would be to draw the handout with a graphics package and then dump it to the printer However this would be black and white and getting colour may well not be worth while, since colour printers are generally more expensive than their b/w counterparts and need extra software It may well be that *Commodore* which produces a colour printer for the C64, has given this capability to the Amiga

Your project is ambitious and you would be wise to scout around the IBM and BBC mags before you definitely set your mind on the ST or Amiga Someone somewhere may well have anticipated your needs and have a package all set up and raring to go The Amiga or the ST are certainly capable of doing the job but they will both probably need some additional equipment and programming before you get any results

Dragon printing

William Dunn of Warley West Midlands writes

Q A short while ago I purchased from Microdeal a copy of its Telewriter which I will be using with my Dragon 32 This wordprocessor is of little use without a printer.

Could you please tell me if the Amstrad DMP 2000 is compatible with the Dragon (the DMP 2000 is my first choice as, if finances allow, I may purchase the Amstrad 6128)

If this printer will not work with the Dragon, could you advise me on a Near Letter Quality printer priced under £175 that will work on both machines The printer will be used mainly for letter writing and, as I am shortly to be made redundant, short story writing

A Both the Amstrad 6128 and the Dragon 32 have Centronics compatible printer interfaces The only difference between them are the cables used to connect them to the printers However both of these should be available from various dealers

If you can't get hold of one it should be easy enough to make one up Your local Tandy dealer will carry all the bits and pieces No soldering involved since the connectors are available in clip on form

One thing to bear in mind about buying the DMP 2000 is that a printer is being sold in a package with the Amstrad 8256 for £458 You may be better off (if finances permit) buying the whole system in one go The DMP 2000 is £159 and the Amstrad 6128 is £299 (green screen) This comes to you guessed it £458 the same as the 8256 Pick your preferred keyboard of the two and see what discounts are available before you decide simply to buy a printer for your Dragon

Microdrive availability

Mr R Bates of Burton Joyce Nottingham, writes.

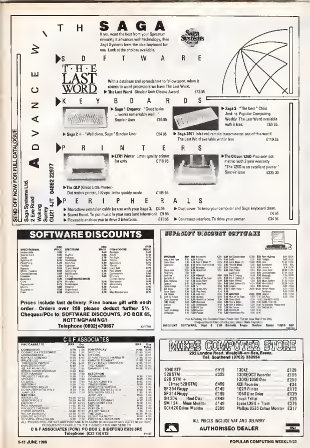
Q Now that the QL is available cheaply, it is an attractive machine provided that the Microdrive cartridges remain in production Can the cartridges from the ICL One-Per-Desk can be used in the QL? If so, where can they be obtained and how much do they cost?

Also, what is the order of issue of the various versions of the Rom and how can the version be determined?

A There are a lot of Microdrive cartridges in circulation so supplies should not be a problem for the foreseeable future In any event ICL will secure continuing supplies for its own use and these are perfectly useable on the QL Transform Ltd, at 24 West Oak Beckenham, Kent BR3 2EZ is selling QL Microdrive cartridges at £1 99 each

As to Rom versions you want a JM or JS and you can determine which is in your machine by entering *Print Ver$*

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD


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Control of the Galaxy

Julian Rosen gives a brief summary of the wide variety of facilities provided by Micronet 800, the database for home computer enthusiasts on Prestel

Micronet 800 is probably one of the best known of all bulletin board style databases with around 20 000 subscribers It is the largest single area on Prestel

Although many of you will at least know of Micronet If not subscribe to it it is worth looking at what Micronet has to offer – it s not all chatlines and telesoftware

Micronet 800 so called because it resides on page 800 of Prestel first came into being in 1983 Initially, it was centred mainly around the BBC micro but now it offers services and information useful and relevant to all computer users However those people owning BBC s, Commodores Spectrums, Apples and Amstrads will benefit especially because Micronet offers special microbases for these machines

These microbases offer a large range of services, including hints and tips for games special offers on software and hardware some telesoftware (programs you can download from Micronet save to disc or tape, and use later), and news relevant to its readers

Of course, these microbases are not all that the Net has to offer On the communications side, Micronet offers an instant electronic mail service So long as you know the numeric address of the person you wish to send a letter to (normally their telephone number unless they have asked to be kept ex-directory) you can type a page of text and send it at the touch of a button

Micronet s Chatline

There is a telex service that is very simple to use Telexes within the UK cost only 57p per frame (one screenful of text) To Europe a telex would cost over £1 00 and to the USA and Canada, £2 00

One of my favourite areas on the Net as it s usually called by subscribers, is the chatlines When you enter the chatlines you can talk to all the other Net users who are already in chatline All you have to do to communicate is to type in your message, and hit the magic button

A few seconds later, that message will be displayed for all other chatline users to read

There are quite a few different types of chatline DaisyChat archives up to 100 messages so you can read up on a conversation before joining it Quickchat is an update-and-destroy chatline The incoming message wipes out the previous message so conversation is purely real-time you can t read through earlier conversations

TurboChat is the newest addition As with DaisyChat, up to 100 messages can be archived Further messages can be sent for 2p which is the same charge Micronet make for sending a DaisyChat frame However TurboChat allows several messages to appear on the screen at the same time with the latest one highlighted This obviously makes conversations much easier to follow and you can talk to several people at once without becoming (too!) confused At present there is only one TurboChat whereas there are seven different Quickchats devoted to different subjects such as music adventuring as well as computing in general

However Micronet says that if response is good enough they will open more, including one for its Multi User Game (MUG), *Starnet*.

Starnet allows 500 people to participate in an attempt to conquer the galaxy which consists of over 3000 stars *Starnet* is computer moderated and for each move, players mailbox the computer with their moves The results of these moves, battle reports and obituaries, are published the next day

The *Starnet* Chatline (soon hopefully to be a TurboChatline) is where alliances with other starship captains are made and also where devious plots at coups are planned What makes *Starnet* fun is that players can co-operate with each other in attempting to kill off a particular starship captain or succeed in capturing a star There is true interaction whether it be violent or peaceful, and this is what makes the game such fun to play

The original *Starnet* was written by Mike Singleton who also wrote the much acclaimed *Lords of Midnight* but was found to be so difficult to administer that it was shelved until Lawrence Kirby came along and re wrote it which explains the considerable delays Micronet experienced in getting the game up and running

The aim of the game is to establish yourself as emperor over the galaxy and this position you must try to maintain as long as possible before you are finally overthrown Starnet s first emperor was Tim Ridge alias Jemal to those who knew him in the game

For his successful efforts he was awarded £150 by Micronet Please note that this was a one-off prize and will not be repeated!

Micronet also has a celebrity chatline where famous, or infamous persons are on-line to answer your questions These are held regularly at a specified time each week

Micronet's Multi User Game *Starnet*

Mary Whitehouse was to have appeared recently but she cancelled her appointment at the last minute by saying that she had something more important to do! Steve Gold of Prestel hacking fame was on the celeb-line recently

The news section on the Net is very comprehensive and up to date providing instant news about the computing industry There is even a Sunday Extra area Micronet s own Sunday 'supplement', with news and reviews, not all of a purely computing nature

There is much more to Micronet than that which I have talked about but this article is meant only as a rundown of the major services offered I will conclude by telling you the costs involved Subscription is £52 per annum and no connect charges are incurred if you use the system after 6pm

You will need a modem capable of 1200/75 baud, and suitable viewdata compatible software

Micronet is definitely worth joining and £52 pa is a small price to pay for the material available on the sytem For further details contact Micronet at Durant House Herbal Hill London EC1 (01-278 3143)



Music and micros – getting started

In the first of a new regular series, Mark Jenkins looks at the potential for making music with your micro

Micro computers turn their hands quite readily to music – after all music is only a mathematically-related series of sounds occurring in time. Of course the best music has elements which can't be reduced to mere mathematics, so even if the computer is your chosen instrument some creativity is essential.

In the not too-distant future it should be possible to choose a computer or synthesiser as an instrument on which to take music exams. Certainly the pop world has rushed to employ computer techniques with the academic world lagging far behind (with the exception of one or two notables such as Dr Peter Zinovieff, the inventor of the British EMS range of synthesisers many years back).

Many of the computers used in the music industry aren't recognisable as such – they're packaged as musical instruments so that musicians can use them. But over the last couple of years it's become obvious to instrument designers that they can save a lot of effort by using a domestic micro such as the Commodore 64, Atari, Apple, IBM PC or Macintosh (well these are all domestic micros in the States!) to perform basic functions such as memory storage and data manipulation.

The computer music explosion began a couple of years ago when the Midi standard was introduced for processor-controlled instruments. Sending musical messages in a manner not a million miles away from the RS232 or other computer standards, Midi can be handled by a small micro with a suitable interface – so now Midi keyboards, drum machines, sequencers, sound samplers, computers and even guitars can be interconnected to give powerful compositional facilities.

So how can the amateur musician with a micro compete with the professional with access to a million-pound studio? You can certainly record the sounds of a C64 or BBC B (arranged with an inexpensive software package), but a hardware keyboard add-on will help you play more fluently. Improved voice modules such as Commodore's Sound Expander will give you more professional sounds similar to those from the £1000 Yamaha DX7. And sound samplers such as those from Datel, Commodore and 2-bit Systems will allow you to go some way towards reproducing the effects of the Mirage and Prophet keyboards (costing £1 500 and £2 000 respectively) and even of the Fairlight computer musical instrument (a snip at £55,000).

If you want to spend a little money on Midi-based synthesisers, the excellent Cesio CZ-101 is the best bet at only £245. Over and above that, there are fine keyboards available from Roland (the analog Alpha Juno 1 at £550), from Yamaha (the digital synthesiser DX100 at £349) and many others.

Ironically, the micro musician can now use exactly the same equipment as a top professional for very little outlay. If you already have a BBC B, a few hundred pounds will buy you the UMI-2B, a hardware/software Midi sequencer package used by Blancmange, A-Ha, Erasure and many others. Tangerine Dream use Commodore-based packages from C-Lab and Steinberg, while Jan Hammer makes up those dirty drum machine sounds for *Miami Vice* on an Apple-based Eprom programmer. In the States, the Hybrid Arts packages for the Atari 130XE are tremendously popular, and although we have yet to hear of a Spectrum or an Electron in the charts, their time will surely come (there's already a powerful Midi interface and software package for the Amatrad).

The attractive aspect of micro-based music making is that you can start (very) cheaply and build up as your interest increases. The software packages will help you play along the way (giving easily understood graphics displays, rounding off your timing, helping you create new sounds and so on) and before long you can be in a position to create highly professional sounds. At that stage, your own creativity and imagination have to take over.

In this column we'll be looking at every available music package coming on to the market, whether it's for a micro's on-board sound chip, for use with hardware add-ons or for control of cheap Midi synthesisers via a suitable interface. If you have any cassettes of your own music we'll gladly have a listen, and we'll be happy to answer any questions on micro based music. Stick with this column and in a couple of years you may be the new Heaven 17.



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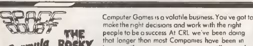
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ATARI 800XL 1050 Disc Drive 1010 Cassette Player Touch Tablet, and Atari Basic Tutor Books and Cassettes £250 o n o or swap for Commodore 64 and 1541 Disc Drive. Phone (0803) 47009

ADVENTURE Probe. Writing, solving or stuck? This is the magazine for you. Sample copy £1 or S.A.E. for details. Pat Winstanley 13 Hollington Way Wigan WN3 6LS

WANTED December 83 Popular Computing Weekly must contain article on 3-D Graphics. Also any other articles on 3-D graphics for the BBC. Private purchase. Phone Ian on 216089

LYNX Software (inc. Lords of Time other Level 9 Adventures) Books magazines cost over £100 – £50 o n o. Burglar took machine! 021 360 7288

ATARI 800 400 the impossible disk backup system works on any disk. Fits into operating Rom module £30 complete with 4K extra RAM and full instructions 948 5864

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ATARI 520ST disk drive (SF354) Boxed As-New £99 01 729 8004

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FOR sale Commodore 1541 disk drive £50 Ferguson TV with RGB £100 Commodore Easy Script Spell file £40 each. All good as new. Ring 0277363891 after 7 pm

AMSTRAD 6128 (Green) CPM plus Pascal (with 2 manuals) C Compiler 3D-Chess Odejob Bridge Player 4 months old. With DMP2000 Printer £400 without DMP2000 Printer £400 without £260 Tel 01 567 4351 (ask for Leven)

AMSTRAD CPC464 Green Screen disc drive loads of tape and disk games (Elite WDW2 get Dexter etc) may sell bargain at £250 ono 01-672 2509

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New Releases

John Cook looks through this week's new arrivals

AMSTRAD

Program *Office Mate* **Type** Utility **Micro** Amstrad **Price** £15 00 **Supplier** Gemini Gemini House Concorde Rd, Exmouth, Devon EX8 4RS

Program *Office Master* **Type** Utility **Micro** Amstrad **Price** £25 00 (tape or disc) **Supplier** Gemini Gemini House Concorde Rd, Exmouth Devon EX8 4RS

Program *Wild Bunch* **Type** Utility **Micro** Amstrad **Price** £1 99 **Supplier** Firebird, Wellington House Upper St Martins Lane, London WC2

Program *Spiky Harold* **Type** Arcade **Micro** Amstrad **Price** £1 99 **Supplier** Firebird Wellington House Upper St Martins Lane, London WC2

Program *Graham Gooch's Test Cricket* **Type** Arcade **Micro** Amstrad **Price** £9 95 (tape) £14 95 (disc) **Supplier** Audiogenic 12 Chiltern Enterprise Centre Station Road, Theale, Berkshire RG7 4AA

Program *Classic Invaders* **Type** Arcade **Micro** Amstrad **Price** £2 99 (tape) £9 95 (disc) **Supplier** Bubble Bus Software 87 High Street, Tonbridge Kent TN9 1RX.

Golly – *Classic Invaders*? It can't be? No? All the memories of a misspent youth come flooding back Leaning up against the wooden cabinet of an Invaders

CLASSIC·INVADERS
AMSTRAD

machine in some dark corner of an under-age pub, trying to make half a pint of weak lager shandy last all night, feeding the machine with 10p s

And now Bubble Bus would have it these glory days can be recreated with *Classic Invaders* Amstrad style, released under its Mini-Bus' range Or can they?

Loading the game shows the same basic scenario as ever – you control a laser base at the bottom of the screen whose destiny is to move left and right, then zap the hordes of aliens that are slowly descending from the top of the screen, to invade the Earth They are also constantly dropping bombs which you must skilfully avoid, only aided by the cover your three bunkers can give you, until they too, are blown to bits

Kill them all then there's another screenful, then another then another

Now don t take me wrong *Classic Invaders* is OK The Invaders are now brightly coloured – quite smart in fact – and the game plays well enough But to my mind they re not green enough not loud enough, and you don't lose money every time you make a mistake

But if you've had your head in a bucket for seven years just bought a computer and want to know what started it all, this is it

Program *Voodoo Rage* **Type** Arcade **Type** Amstrad **Price** £1 99 **Supplier** Antarctic, Arctic Computing Main St, Brandesburton, Yorkshire YO25 8RL

Program *Kane* **Type** Adventure **Micro** Amstrad **Price** £2 99 **Supplier** Mastertronic 8-10 Paul St London EC2

Program *Rad Zone* **Type** Arcade **Micro** Amstrad **Price** £1 99 **Supplier** Mastertronic 8-10 Paul St, London EC2.

Program *Turbo Esprit* **Type** Arcade **Micro** Amstrad **Price** £8 95 **Supplier** Durell Castle Lodge Castle Green Taunton Somerset TA1 4AB

ATARI

Program *King s Quest* **Type** Adventure **Micro** Atari ST **Price** £29 95 **Supplier** Mirrorsoft Purnell Book Centre Paulton Bristol BS18 5LQ

Pick of the week

Molecule Man

Program *Molecule Man* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Mastertronic 8-10 Paul St London EC2

Mastertronic is just about to enter the big time Three titles in the CES Hall of Fame this season indicates that the American side of things is just about to take off, and there are some cracking titles in the pipeline for release soon

Flash Gordon is one to look out for in August – *Ninja* is promised to be the martial arts game to beat all martial arts games And next month (you read it first here folks!) an Amstrad version of the arcade hit of '86 *Gauntlet* to be named *Storm* These are the guys that all the other budget software houses have to beat and you can see why with something like *Molecule Man*

This one has you controlling something that looks a bit like the bubble in all the Corona adverts, around 256 *Knight Lore* type screens The single colour display and varied graphics are both done in a workman-like fashion

The scam is that you are stuck in this maze/planet/whatever, deadly radiation all about you and must collect 16 electric circuits in order to enable you to teleport off

To aid you you need pills (which ward off the effects of the rays for a time) and bombs (no explanation needed – what would *you* do with a bomb?), both of which can be obtained from dispensers dotted around the place – if you have a coin which in turn are found etc etc

This makes it an acceptable enough race against-time arcade adventure – and at £1 99 would have more than enough to recommend it to lovers of this genre

The surprise comes on side B of the tape – a maze designer/editor that allows you to alter the existing maze or create your own edit each and every screen to make it harder or maybe easier (ha ha) you name it, you can alter it save it to tape and then play your own version of the game Or challenge a friend to play your version Or invert a completely new game around the existing character and objects This must increase the playing life of a game at least five-fold

Program *The Black Cauldron* **Type** Adventure **Micro** Atari ST **Price** £29 95 **Supplier** Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 5LQ

BBC

Program *Office Mate* **Type** Utility **Micro** BBC B **Price** £12 00 (tape or disc) **Supplier** Gemini Gemini House Concorde Rd Exmouth, Devon EX8 4RS

Program *Office Master* **Type** Utility **Micro** BBC B **Price** £25 00 (tape or disc) **Supplier** Gemini, Gemini House Concorde Rd Exmouth Devon EX8

Program *BBC Money Management* **Type** Utility **Micro** BBC B **Price** £12 95 (disc only) **Supplier** Gemini Gemini House Concorde Rd Exmouth Devon EX8

Program *Woks!* **Type** Arcade **Micro** BBC/Electron **Price** £1 99 **Supplier** Arctic Computing, Main St Brandesburton Yorkshire

How s this for a plot? The Emperor has confiscated everyone s woks – because he thinks they are eating too much fatty food – and placed them in strongrooms with lots of ladders and guards



You as the people's champion must rescue them. Does this win the prize for the thinnest and silliest disguise for a collect and dodge game or what?

Still the graphics are chunky BBC, but colourful, and the gameplay is diverting enough for a short while (Collect and dodge with a touch of *Amidar* I should have said)

Unpretentious, undemanding and cheap. You could do worse.

Program *BBC Life and Business Organiser* **Type** Utility **Micro** BBC B **Price** £19.95 (disc or Rom) **Supplier** Gemini, Gemini House, Concorde Rd, Exmouth, Devon EX8 4RS

Program *Statutory Sick Pay Package* **Type** Utility **Micro** BBC B **Price** £39.95 **Supplier** Gemini, Gemini House, Concorde Rd, Exmouth, Devon EX8 4RS

Program *The Great Wall* **Type** Arcade **Micro** BBC B **Price** £1.99 **Supplier** Antarctic, Arctic Computing, Main St, Brandesburton, Yorkshire YO25 8RL.

C16/Plus 4

Program *Runner* **Type** Arcade **Micro** C16/Plus4 **Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martins Lane, London WC2

Program *Shark* **Type** Arcade **Micro** C16/Plus4 **Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martins Lane, London WC2

Program *Baby Berks* **Type** Arcade **Micro** C16/Plus4 **Price** £1.99 **Supplier** Alpha Omega, CRL Group, 9 Kings Yard, Carpenters Rd, London E15

Program *The Exploits of Fingers Malone* **Type** Arcade **Micro** C16/Plus4 **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul St, London EC2

Program *Street Olympics* **Type** Arcade **Micro** C16/Plus4 **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul St, London EC2.

COMMODORE 64

Program *Nexus* **Type** Arcade Adventure **Micro** Commodore 64 **Price** £9.95 (tape) £12.95 (disc) **Supplier** Nexus Productions, DSB House, 30 High St, Beckenham, Kent BR3 1AY

Program *Return of the Space Warrior* **Type** Arcade **Micro** Commodore 64 **Price** £1.99 **Supplier** Alpha Omega, CRL House, 9 Kings Yard, Carpenters Rd, London E15

It must be the time of the year, but there's a lot of so-called budget titles around right now. My theory is that this is supposed to lure school kids back to their computer during the summer – when they should, naturally, be out annoying the neighbours. Still, this is an offering from CRL's budget label Alpha Omega called *Return of the Space Warrior*. "It had to be a nightmare," says the cassette inlay, and true enough, it is – namely a fairly lame version of *Joust*.

Joust you might remember was a highly original game in its time. Played on a screen with downwards gravity (and strategically place platforms for you to rest on) you played a knight aboard a gryphon-like beast armed with a lance. You pressed fire to flap your beast's wings (and therefore gain height) which was of great importance in the game, as if you collided with an enemy, you would die if your lance was lower than his.

Back at *Space Warrior*, gone are the Gryphons (in come ovulaspheres – blobs to you) and the lances and the excellent two player option in which you could play simultaneously on screen with a friend. What you are left with is a game which admittedly can get quite fast – but is totally lacking in visual appeal and atmosphere. Mediocre budget fare I'm afraid.

Program *Bump Set Spike* **Type** Arcade **Micro** Commodore 64 **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul St, London EC2

SPECTRUM

Program *Spike* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird Software, Wellington House, Upper St Martins Lane, London WC2

Program *Helichopper* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martins Lane, London WC2

Program *Wild Bunch* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martins Lane, London WC2

Program *The Boggit* **Type** Adventure **Micro** Spectrum **Price** £7.95 **Supplier** CRL Group, 9 Kings Yard, Carpenters Rd, London E15

Program *Dragon of Notacare* **Type** Adventure **Micro** Spectrum **Price** £2.50 **Supplier** David Edgar, 1 High Parksail, Erskine, Scotland PA5 7HY

Program *The Master* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Antarctic, Arctic Computing, Main St, Brandesburton, Yorkshire YO25 8RL

Program *Office Master* **Type** Utility **Micro** Spectrum **Price** £15.00 (tape) £17.50 (microdrive) **Supplier** Gemini, Gemini House, Concorde Rd, Exmouth, Devon EX8 4RS

Program *Conquest* **Type** Arcade **Micro** Spectrum **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul St, London EC2

Program *Ninja Master* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martins Lane, London WC2.

Now you'd expect a program entitled *Ninja Warrior* to be all gore, broken bones and white pyjama tops, wouldn't you?

Well no ... you'd be wrong – for a start we all know that the sneaky Ninja ... a breed of warriors feared by all ... only ever wear black, so as to sneak up on unsuspecting passers-by and generally do the dirty on them in the depths of the night. And also in this martial arts epic, the only blood ever spilt is your own.

It is the annual Ninja games – and this is your big chance to impress the elders. Yup, Bruce Lee finally meets Daley Thompson. There are four tests in all: The punch the approaching arrows test. The chopping the log in half test (this is a hammer on two keys job). The deflect the stars test (high, middle or low). Finally a zap the cane with the blow pipe test. Like all the other sports simulations, you are given three chances to attain a qualifying score to pass on to the next test.

The graphics (mostly black on yellow) are not really that good, the gameplay isn't that good and the sound consists of two sampled screams which you will soon get tired of.

Put it this way, despite all the chopping and parrying, this is not another *Thrust*.

Program *Pentagram* **Type** Arcade **Micro** Spectrum **Price** £9.95 **Supplier** US Gold, Unit 10, The Parkway Industrial Centre, Heneage St, Birmingham B7

QL

Program *Life and Business Organiser* **Type** Utility **Micro** QL **Price** £19.95 **Supplier** Gemini, Gemini House, Concorde Rd, Exmouth, Devon EX8 4RS

Program *Executive Adventure* **Type** Adventure **Micro** QL **Price** £12.95 **Supplier** Gemini, Gemini House, Concorde Rd, Exmouth, Devon EX8 4RS

Program *Dragonhold* **Type** Arcade **Micro** QL **Price** £19.95 **Supplier** Rubicon Computer System, 11 Bannerdale Rd, Sheffield, S7 2DJ

Charts

Top Twenty

1	(–)	World Cup Carnival *(Spectrum, Amstrad, C16)*	US Gold
2	(3)	Kik Start *(Spectrum C64, C16, Atari)*	Mastertronic
3	(5)	Batman *(Spectrum, Amstrad)*	Ocean
4	(2)	Formula One Simulator *(Various)*	Mastertronic
5	(1)	Thrust *(C64)*	Firebird
6	(7)	International Karate *(Spectrum, C64)*	System 3
7	(–)	Cauldron 2 *(C64)*	Palace
8	(4)	Commando *(Various)*	Elite
9	(6)	Spindizzy *(Spectrum C64 Amstrad)*	Electric Dreams
10	(8)	Rock 'N Wrestle *(Sp, C64, Am)*	Melbourne House
11	(15)	Saboteur *(Spectrum, C64 Amstrad)*	Durell
12	(9)	Bomb Jack *(Spectrum, C64, Amstrad)*	Elite
13	(–)	Knight Tyme *(Spectrum)*	Mastertronic
14	(16)	Last V8 *(C64, Amstrad Atari)*	Mastertronic
15	(14)	Vegas Jackpot *(Various)*	Mastertronic
16	(–)	Biggles *(C64)*	Mirrorsoft
17	(–)	One Man And His Droid *(Various)*	Mastertronic
18	(–)	Ninja Master *(Spectrum)*	Firebird
19	(–)	Green Beret *(Spectrum, C64)*	Imagine
20	(–)	Heavy On The Magik *(Spectrum)*	Gargoyle Games

Straight in at number one

Biggles flies in at 16

Top Tens

All figures compiled by Gallup/Microscope

Thrust – knocked off the top

Amstrad

1	(–)	Batman	(Ocean)
2	(8)	Winter Games	(Epyx/US Gold)
3	(3)	Commando	(Elite)
4	(1)	Get Dexter	(PSS)
5	(–)	World Cup Carnival	(US Gold)
6	(–)	Bounder	(Gremlin)
7	(4)	Elite	(Firebird)
8	(4)	Last V8	(Mastertronic)
9	(–)	One Simulator	(Mastertronic)
10	(10)	Into Oblivion	(Mastertronic)

Commodore 64

1	(–)	World Cup Carnival	(US Gold)
2	(1)	Thrust	(Firebird)
3	(2)	Int Karate	(System 3)
4	(–)	Cauldron 2	(Palace)
5	(6)	Biggles	(Mirrorsoft)
6	(8)	Saboteur	(Durell)
7	(3)	Spindizzy	(Electric Dreams)
8	(–)	Bump Set Spike	(Mastertronic)
9	(7)	One Simulator	(Mastertronic)
10	(10)	Golf	(Artolesoft)

Atari

1	(–)	Kik Start	(Mastertronic)
2	(1)	Vegas Jackpot	(Mastertronic)
3	(3)	Last V8	(Mastertronic)
4	(8)	One Man & his Droid	(Mirrorsoft)
5	(4)	New York City	(Americana)
6	(5)	Snooker	(Americana)
7	(7)	Shamus	(Americana)
8	(6)	Fighter Pilot	(Digital Int)
9	(2)	Action Biker	(Mastertronic)
10	(10)	Arcade Classics	(Datasoft)

BBC

1	(1)	Commando	(Elite)
2	(–)	Bruce Lee	(US Gold)
3	(6)	Tennis	(Bugbyte)
4	(8)	Jack Attack	(Bugbyte)
5	(–)	Jet Set Willy	(Ware Projects)
6	(3)	Winter Olympics	(Tynesoft)
7	(–)	Comp Hits 10	(Beau Jolly)
8	(–)	Galactic Patrol	(Mastertronic)
9	(16)	Combat Lynx	(Durell)
10	(–)	Death Star	(Superior)

Spectrum

1	(–)	World Cup Carnival	(US Gold)
2	(1)	Batman	(Ocean)
3	(–)	Knight Tyme	(Mastertronic)
4	(8)	Rock N Wrestle	(Mel House)
5	(4)	Green Beret	(Imagine)
6	(–)	Ninja Master	(Firebird)
7	(7)	Heavy On The Magick	(Gargoyle)
8	(9)	Bomb Jack	(Elite)
9	(6)	Fireman	(Mastertronic)
10	(–)	Quazatron	(Hewson)

NEXT WEEK

● CES report

The Summer Consumer Electronic Show in Chicago is the world's biggest exhibition for the home computer industry. We'll have all the news and brand new products from the show

● Language series

Next week we focus on Pascal the highly structured language which is rapidly becoming an industry standard

● Soundcheck

Don't miss the next in Mark Jenkins new regular music column

● Plus . . .

Win a copy of the forthcoming release from Nexus in our Arcade Action competition

The Hackers







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Spectrum/Amstrad
MIKRO-GEN
Unit 15 The Western Centre
Western Road
Bracknell
Berks.

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CYBERUN

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"Once you start playing the game it becomes increasingly clear that Ultimate have produced yet another excellent game The playing area is huge and there are some excellent graphical effects like the stars which are beautifully parallaxed"

"Playability wise Cyberun is an excellent game."

"The inlay card doesn't give much away, so it is a challenge just to find out what all the various goodies are for"

"This is a classic shoot 'em up which I'm sure all fans of Lunar Jetman will enjoy."

CRASH May 1986

PENTAGRAM and CYBERUN are available for the Spectrum 48k and Amstrad from selected branches of W.H. Smith, Boots, John Menzies, Woolworths and all good software stores. They are also available from Ultimate Play the Game, The Green, Ashby-de-la-Zouch, Leicestershire LE6 5JU. (Postage and packing included.)

£9.95 including VAT

PENTAGRAM

